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FISH AND WILDLIFE SERVICE

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DIVISION OF RESOURCE DEVELOPMENT

RALPH C. BAKER, ASST. DIRECTOR



# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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## RAPID SPREAD OF BARNACLE INVESTIGATED

Investigation is being carried out on the world's rapid spread of the barnacle (*Eliminius modestus*), also known as the Australian barnacle, which first turned up in European quarters in 1945 at Chichester, and by 1953 had reached the German coast, spreading rapidly to the estuarine system of the River Elbe and the Schleswig-Holstein coast. It reached the islands of Helgoland and Sylt by 1955. This presumably passive passenger is now common in many European coastal areas and competes with the native barnacle (*Balanus*), the acorn barnacle, but it is known to be less tolerant of low water temperatures which have held production to a less rapid rate than might have been possible. (*Sea Secrets*, April 1964.)



Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

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## IMPROVED RAPID METHOD FOR DETERMINING TOTAL LIPIDS IN FISH MEAL

By Preston Smith, Jr.\*, Mary E. Ambrose\*, and George N. Knobl, Jr.\*\*

### ABSTRACT

In a search for a quicker method for the determination of total lipids in fish meal than the currently used method of the Association of Official Agricultural Chemists, the rapid Bligh and Dyer method for determining the lipid in fish meal was studied. Problems involving filtration and emulsions were encountered, which were largely eliminated, respectively, by using diatomaceous earth and anhydrous sodium sulfate and by increasing the initial ratio of solvent to water in the extraction process. Thus modified, the Bligh and Dyer method gave results in close agreement with those obtained by the more time-consuming AOAC method.

### INTRODUCTION

Fish meal is one of several ingredients usually contained in commercial mixed feeds for animals. The manufacturers of those feeds are careful to ensure that the nutritive value of their products remains uniform and consistently high in quality. Hence fish meal and the other ingredients used in the formulations are carefully checked. Ordinarily, fish meal is analyzed for such components as moisture, nitrogen, and lipid content. The nitrogen content is indicative of the amount of protein present, and the lipid content provides an index of the caloric value of the meal.

Unlike the closely specified procedure used for ascertaining the content of nitrogen, the content of lipid may be determined by any of several methods. The method that has been used quite satisfactorily as an index for caloric value is that of ether extraction (crude fat). Recently, however, there has been a growing demand for information on the fats or lipids in fish meals that cannot be extracted by ether ("total" fat)<sup>1</sup>, since there is speculation that the difference between total fat and crude fat may indicate the degree of oxidation of the fat.

The method of the Association of Official Agricultural Chemists for determining total lipids in fish meal provides consistent-

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1/"Total" fat, for purposes of this paper, will be the value obtained by the method (22.037) of the Association of Official Agricultural Chemists (1960).



Determination of lipids in fish meal by the modified Bligh and Dyer method.

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ly reproducible results and gives values among the highest obtained by any method. In the AOAC method, the initial extraction of fish meal is followed by acid hydrolysis and then by a second acetone extraction. These conditions presumably free the "bound" lipids and extract "total" lipids from the fish meal. Because this method requires over 35 hours to complete, it is not a rapid analytical tool.

In 1959, Bligh and Dyer developed a rapid extraction procedure to measure the lipids in raw fish. Briefly, their method consists of homogenizing the fish tissue with a mixture of chloroform and methanol in such proportions that a miscible system is formed with the water in the tissues. Subsequent dilution with chloroform and water then separates the homogenate into two phases. After filtration and clarification, the chloroform layer contains the lipids, and the methanol-water layer contains the nonlipid material. Unfortunately, though this method is rapid, it is not entirely satisfactory for use with fish meal.

The purpose of the work reported in this paper therefore was to try to modify the rapid Bligh and Dyer method so that it can be used to determine reproducibly and accurately the total lipids in fish meals. The main topics considered in this report are the following:

1. Modifications needed in the Bligh and Dyer method.
2. Description of the modified method developed.
3. Evaluation of the modified method.

#### MODIFICATIONS NEEDED

In our study of the modifications needed to adapt the Bligh and Dyer method for use with such materials as fish meal, five menhaden meals were used. (Menhaden meal constitutes the bulk of the fish meal produced in the United States.) These meal samples differed in age and were from various areas of production. The principal difficulties encountered in the use of the Bligh and Dyer method in the analysis of these meals arose from problems relating to filtration and emulsions.

**FILTRATION:** When the unaltered method was used with the fish meals, two of the samples would not filter satisfactorily. Hyflo Super Cel (diatomaceous earth), however, has been used in column chromatography (Hanahan, Dittmer, and Warashina 1957) to enhance the flow of lipids through columns. This product and anhydrous sodium sulfate were therefore used in an attempt to improve filtration. By this procedure, all five samples filtered faster and gave a clearer filtrate than was obtained with the unmodified Bligh and Dyer method.

**EMULSIONS:** Emulsions were formed in all five samples tested. The following procedures were tried in an attempt to lessen the formation of emulsions: (1) addition of neutral salts--sodium chloride, potassium chloride, and magnesium chloride; (2) use of higher alcohols for extraction--methanol was replaced by ethanol and octanol; (3) use of a surfactant--Aerosol OT; (4) centrifugation; and (5) changes in the ratio of the organic solvents.

The sample that gave the largest amount of emulsion with the unmodified Bligh and Dyer method was used to evaluate these procedures. Changes in the ratio of the organic solvents proved to be the most beneficial of the alterations tried, so this modification was studied in detail. The phase-volume ratio was changed from an initial ratio of 50 ml. of chloroform: 100 ml. of methanol, to 100 ml. of chloroform : 100 ml. of methanol, and finally to 150 ml. of chloroform : 100 ml. of methanol. Higher values for extractable material were obtained with both modifications in ratio of solvents. The last ratio of solvents, however, also resulted in both decreased emulsions and in improved filtration and was therefore considered the more satisfactory.<sup>2/</sup> Table I presents the results of extraction of lipid by the unmodified Bligh and Dyer method and by the various modifications in the ratio of solvents.

<sup>2/</sup>In addition, this ratio of solvents resulted in a biphasic system throughout the extraction procedure. Hence, some people may interpret this approach as a new application of chloroform:methanol extraction rather than a modification of the Bligh and Dyer method.

Table 1 - Fat Extracted from Samples of Fish Meal by Variations of the Bligh and Dyer Method

Table 1 - Fat Extracted from Samples of Fish Meal by Variations of the Bligh and Dyer Method						
Extraction Method	Replicate	Fat Content of Fish-Meal Sample:				
		E	6C79	4B120	12C13	G
..... (Percent) .....						
1. Original method 50 CHCl <sub>3</sub> /100 MeOH	{ 1	11.87	9.44	1/-	11.81	1/-
	{ 2	12.1	9.38	-	11.93	-
2. Filtering aid 50 CHCl <sub>3</sub> /100 MeOH	{ 1	11.86	9.19	13.19	11.52	10.23
	{ 2	11.68	9.10	13.44	11.65	10.90
3. Filtering aid 100 CHCl <sub>3</sub> /100 MeOH	{ 1	12.82	9.90	14.76	12.59	10.36
	{ 2	13.42	9.64	14.78	12.23	10.31
4. Filtering aid 150 CHCl <sub>3</sub> /100 MeOH	{	12.80	10.22	14.51	12.51	10.41

1/The samples were not filterable.  
Note: Each entry represents a single analysis except Method 4 where each entry is the average of six analyses. Column headings "E," "6C79," etc. identify number of sample.

## MODIFIED METHOD

The modified method resulting from the observations reported in the previous section is as follows:

1. Homogenize 10 grams of fish meal in an electric blender for 2 minutes with a mixture of 37 ml. of water, 150 ml. of chloroform (analytical reagent grade), and 100 ml. of absolute methanol (analytical reagent grade).
2. Add 50 ml. of chloroform to the mixture, and blend for an additional 30 seconds.
3. Transfer the mixture to a 600-ml. beaker containing 20 grams of Hyflo Super Cel and 20 grams of anhydrous sodium sulfate.
4. Mix the contents; and filter into a 1,000-ml. filter flask, using a Buchner funnel and Whatman number 1 filter paper.
5. Add 50 ml. of water to the filtrate, and mix thoroughly.
6. Transfer the filtrate to a 500-ml. graduated cylinder.
7. Reblend the residue for 2 minutes with 200 ml. of chloroform, and then refilter.
8. Add the filtrate to the cylinder.
9. Wash the blender jar, beaker, and filtering flask with about 50 ml. of chloroform.
10. Filter the washings and add them to the cylinder.
11. Allow a few minutes for separation and clarification of the filtrate, record the volume of the chloroform, and remove most of the methanol-water layer by aspiration.
12. Mix the contents of the cylinder, and remove the remaining methanol-water layer and also a small volume of the chloroform layer.
13. Take a 25-ml. aliquot of the chloroform layer, and dry it under a stream of nitrogen in a 50° C. water bath.
14. Place the dried sample in a vacuum dessicator over phosphorus pentoxide, and allow to dry overnight.
15. Calculate the weight of the total lipid in the sample as follows:

$$\text{Wt. of total lipid} = \frac{\text{Wt. lipid in aliquot} \times \text{volume of chloroform layer}}{\text{Volume of aliquot}}$$

## EVALUATION

In evaluating the modified Bligh and Dyer method, we were concerned with the following four aspects:

1. Purity of the lipid extract obtained by the modified method.
2. Precision of the method.
3. Accuracy of the method.
4. Comparison of the results obtained by the method with those obtained by the AOAC method.

**PURITY:** The material extracted by organic solvents usually contains some nonlipids. In a satisfactory method for determining lipid, this extract of nonlipid material must, of course, be kept to a minimum. Accordingly, we tested the purity of the extracted material by drying an aliquot of the extracted fat, redissolving it in chloroform, and observing it for undissolved residue. With the improved initial ratio of 150 ml. of chloroform : 100 ml. methanol for extraction, no residue was noted in any of the samples tested. However, in some of the other procedures tested, residue was observed.

**PRECISION:** To determine the reproducibility of results of the improved procedure, we analyzed each of five menhaden meals six times, and evaluated the results statistically. As is shown in table 2, the maximum deviation from the mean was +0.23 percent.

Sample	Mean	Standard Deviation	Standard Error
		(Percent)	
E	12.80	0.14	0.06
G	10.41	0.11	0.04
6C79	10.22	0.23	0.10
4B120	14.51	0.20	0.08
12C13	12.51	0.21	0.09

Note: The mean represents the average of six analyses.

**ACCURACY:** Test results on samples to which oil has been added should give an indication of the accuracy of the method in terms of the possible errors in the mechanical manipulations, although not in terms of the ability of the system to extract bound fat.

Sample	Fat Present			Fat by Analyses	Recovery
	In Sample	In Oil	Total		
			(Percent)		
E	12.71	3.00	15.71	16.05	102.2
		3.04	15.75	15.79	100.3
G	10.56	3.22	13.78	13.93	101.1
		3.16	13.72	13.39	97.6
6C79	10.48	3.04	13.52	13.66	101.0
		3.01	13.49	13.48	99.9
4B120	14.67	3.08	17.75	17.41	98.1
		3.23	17.90	18.20	101.7
12C13	12.72	3.03	15.75	15.51	98.5
		3.20	15.92	15.61	98.1

Recoveries were tested by extracting mixtures of 0.3 grams of menhaden oil with 10 grams each of the same five menhaden meals. Table 3 presents the recovery data, showing that the widest variation in the recovery of menhaden oil was 2.2 percent.

**COMPARISON:** The AOAC method 22.037 for the determination of fat in fish meal was used for comparison. The data in table 4 show that closely comparable results were obtained by the AOAC method and the modified Bligh and Dyer method. It is interesting to note that the values obtained with the modified method were lower for four meals, but that for one meal,

more lipids were found than by the AOAC method. In no pair of values, however, was the absolute difference greater than 0.48 per cent.

### SUMMARY AND CONCLUSION

In trying to shorten the time of analysis required by the AOAC method for total lipid in fish meal and similar products, we studied the possibility of adapting the Bligh and Dyer method used for analyzing the lipid in fish meat. We used five samples of menhaden meal of varying age and lipid content in developing and testing the modified method.

Applying to fish meal the Bligh and Dyer method--which utilizes chloroform, methanol, and water in such proportions that after the initial extraction, a two-phase system is formed--results in problems involving filtration and emulsions. Filtration was improved by the addition of diatomaceous earth and anhydrous sodium sulfate. Emulsions were largely eliminated by increasing the initial ratio of solvent to water.

The purity of the extract was tested by drying an aliquot of the extracted fat, redissolving it in chloroform, and checking for insoluble material. After the ratio of solvent to water was changed, no residue was noted in any of the five samples tested. The precision of the method was checked by analyzing six replicates of each of the five menhaden meals and evaluating the results statistically. The maximum deviation from the mean was  $\pm 0.23$  percent. The accuracy of the improved method was determined by the percent recovery of added menhaden oil to the same five fish meal samples. The widest variation noted in recovery was 2.2 percent. Lipid determination by the improved method compared favorably with results from AOAC method 22.037.

We concluded that in the analysis of menhaden meal and presumably of other fish meals the modified rapid Bligh and Dyer method could serve satisfactorily as a substitute for the more time-consuming AOAC method.

### LITERATURE CITED

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS  
1960. Official Methods of Analysis. 9th Ed. Assoc. of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C., Section 22.037, pp. 287-288.

BLIGH, E. G., and W. J. Dyer  
1959. A Rapid Method of Total Lipid Extraction and Purification. Canadian Journal of Biochemistry and Physiology, vol. 37, pp. 911-917.

HANAHAN, D. J.; J. C. DITTMER; and E. WARASHINA  
1957. A Column Chromatographic Separation of Classes of Phospholipids. Journal Biological Chemistry, vol. 228, pp. 685-700.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



# TRENDS AND DEVELOPMENTS

## Alaska

### TRENDS AND DEVELOPMENTS, APRIL 1964:

Developments in the Alaska fisheries following the March 27 earthquake, foreign fishing activity, and other developments for April as reported by the U. S. Bureau of Commercial Fisheries Alaska Regional Office, Juneau:

Commercial Fishing Industry Still Operational in Spite of Earthquake: The March 27, 1964, earthquake in Alaska caused widespread rising or subsidence of large sections of land masses in Alaska. The epicenter was apparently in the Prince William Sound area. As of the end of April, information indicated that the fault line extended from east of Kodiak northerly through the Kenai Peninsula. West of that fault line the land masses subsided 5 or 6 feet, and east of the fault line the land was raised 5 or 6 feet. Along with this tremendous earth movement were tidal waves which inundated large parts of the lowlands surrounding the Gulf of Alaska. Southeastern Alaska, east of Yakutat, was virtually unaffected. The Alaska Peninsula, Aleutian Islands, Bristol Bay, and Arctic coastline also suffered little damage. The prin-

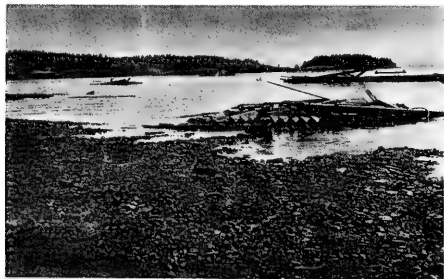


Fig. 1 - This is what the harbor at Kodiak looked like after the earthquake. Pieces of the dock are floating here as well as resting inland. Tides now running 8 feet higher than old maximums.

cipal damage occurred in the Cook Inlet, Kodiak Island, and Prince William Sound areas.

Although the impact of the quake and waves destroyed many boats, skiffs, gear, and some shore plants, the overall impact on the fishing industry was not as severe as at first indicated. The suffering and hardship to individuals cannot be minimized, but the fishing industry as a whole was still functional a month after the catastrophe.

The king crab fishery was the hardest hit with about 15 to 20 percent of its 1963 capability destroyed. The shrimp fishery suffered relatively minor damages, although the largest shrimp plant at Seward was lost. While many salmon vessels and two salmon plants were destroyed, the salmon industry retains the capability for harvesting the 1964 run in the normal fashion. Halibut cold-storage plants lost or damaged will cause a redistribution of this season's halibut landings but, otherwise, the halibut industry remains fully capable. The Dungeness crab fishery suffered considerably in the Cordova area with the loss of hundreds of pots and some plant and boat damage. By the end of April it was back in operation almost at full scale. Razor clam beaches off Copper River flats were raised and shifted and some clam mortality occurred, but that industry was going ahead with good results. About 50 to 75 percent of the Copper River flats salmon gill-net fishing area was high and dry in April and state regulations in that area will be changed.

The effects of the quake and waves and the changes in elevation may have severe effects on the fish themselves. At least 30 miles of red snapper were observed floating dead on the surface. The effects of waves, silting, and of millions of gallons of gas and oil dispersed into intertidal zones have caused unevaluated damage. Slides and the falling and shifting of ice undoubtedly had some impact on the resource.



Fig. 2 - Viewing upper downtown section of Kodiak from a hillside. About 24 dwellings were demolished, and many others were moved as much as 4 blocks off their foundations. A good part of the business district sustained substantial damage.



Fig. 3 - Part of the downtown section of Kodiak after the earthquake. Note how vessels were tossed onto the land.

Damage to docks and waterfront facilities, because of the change in elevation, may well exceed the actual damage of the quake and waves. The east side of Kodiak Island has subsided 5 to 6 feet and several major docks and plants probably must be relocated. Homer Spit and Seldovia also appear to be 3 or 4 feet lower and will require extensive dock and plant relocation. The land mass around the Cordova area raised in some places as much as 6 feet and docks, boat ways, and dolphins will require extension or relocation. The entire city of Valdez will be relocated.

Soviet Fishing Fleet off Yakutat: The Soviet trawling fleet operating off Yakutat during April 1964 extended from Cape St. Elias to the Fairweather grounds northwest of Cape Spencer. That fleet included about 95 trawlers, 16 reefers, 3 factoryships, 2 cargo ships, 1 salvage tug, and 1 tanker. The

Soviet catches appeared to be almost entirely Pacific ocean perch, with no salmon, halibut, or appreciable quantities of other incidental species evident. The Soviet trawlers were fishing in depths of 100 to 165 fathoms, averaging about one hour per drag, and with catches varying between 1,000 and 20,000 pounds. That fleet off Yakutat constituted the most easterly concerted Soviet fishery so far.

Soviet Crab Fleet Off Kodiak: The Soviet crab factoryship Pavel Chebotnyagin and her tangle net-setting SRT's were observed fishing king crab in the Gulf of Alaska on April 6, about 15 miles north of Chirikof Island south of Kodiak Island. Surface and aerial observations of that vessel's operation were analyzed and it was tentatively estimated the catch by that fleet might exceed 30,000 crabs a day. On April 20, aerial patrol units observed the Chebotnyagin under way about 40 miles south of Chirikof Island, indicating the Soviets had withdrawn from the Kodiak area. On April 22, she left the Gulf of Alaska and entered the Bering Sea via Unimak Pass. As of the end of April, she was operating off Unimak Island.

Soviets Continue to Fish Portlock Bank: The Soviet trawling fleet centered in the Portlock Bank region east of Kodiak has remained at a relatively constant level and is estimated to include 8 trawlers and 2 reefers. There is considerable interchange between that fleet and the larger trawling fleet off Yakutat, both of which are fishing mainly for Pacific ocean perch.

Soviet "Flounder" Activities in Bering Sea: Trawling activities in the eastern Bering Sea by Soviet vessels were at their lowest level this year in April as the flounder expeditions were apparently being terminated and/or diverted to other fisheries. The flounder fleet consisted of about 25 trawlers, 5 reefers, 1 factoryship, and various support vessels.

Soviet Vessels Fish for Shrimp in Bering Sea: The Soviets were engaged in a shrimp fishery northwest of the Pribilof Island, it was confirmed in April. Personnel of Japanese shrimp fishing fleets in the area reported that two Soviet trawlers had been active in that fishery for nearly three weeks. One of the Soviet vessels was observed making one haul yielding an estimated 800 pounds of shrimp.

Japanese King Crab Fleet in Outer Bristol Bay: A Japanese king crab fleet consisting

of the factoryships Tokei Maru and Tainichi Maru, each accompanied by six catcherboats, was reported fishing tangle net gear, centered in outer Bristol Bay north of Port Moller during April.

**Japanese Shrimp Fishery:** The Japanese shrimp factoryship Chichibu Maru and her accompanying fleet of 12 trawlers left the area northwest of Unimak Pass during April and moved into the more common Japanese shrimp grounds north of the Pribilof Islands. The shrimp factoryship Einin Maru and her reported 12 trawlers were operating in the vicinity of the Chichibu Maru fleet at the time.

**Japanese Long-Line Fishery:** It was believed the Japanese long-line fleets that entered the Bering Sea halibut fishery in the 3B North Triangle area abandoned the halibut grounds near Unimak Pass and moved north nearer the Pribilof Islands. The Fuji Maru No. 3, with 5 accompanying long-line fishing vessels, was sighted southeast of St. George Island in April.

**Japanese "Exploratory" Fishing in Gulf of Alaska:** The Japanese stern trawler Taiyo Maru No. 81 was reported operating about 40 miles south of the southwest end of Kodiak Island during April. The second Japanese trawler to conduct "exploratory" fishing in the Gulf of Alaska, the 545-gross-ton side trawler Tenryu Maru, was scheduled to leave Japan on April 15 but had not yet been sighted in the Gulf.

**Seismic Exploration Agreement Completed:** Negotiations were completed providing safeguards for living marine resources during seismic explorations utilizing explosives in the waters off Alaska. The Bureau of Commercial Fisheries and the Alaska Department of Fish and Game developed provisions governing explosive detonations to minimize the possibilities of damage to marine life and commercial fisheries. Those provisions are incorporated into seismic permits issued by the Alaska Department of Fish and Game for exploration in State of Alaska waters and by arrangement with the U. S. Bureau of Geological Survey are integrated into their permits for seismic exploration in the international waters of the outer continental shelf. Fisheries observers will accompany all seismic teams subject to the provisions to ensure compliance. Those observers are empowered to halt operations any time excessive kills of marine life occur or are likely to occur.

A cooperative agreement between the Bureau of Commercial Fisheries and Alaska Department of Fish and Game provides that the observers will function with equal authority whether in State or International waters.

**First Halibut of Season Landed at Ketchikan:** Several fares of halibut from the Bering Sea were sold through the Ketchikan Fish Exchange during April. The first trip was delivered to Ketchikan this season by the vessel Yakutat on April 15. Bidding by the local buyers brought a standard price of 18.10, 18, and 10 cents for large, medium, and chicken halibut, respectively.

**Herring Roe-on-Kelp Harvest:** The herring roe-on-kelp fishery at the west coast villages of Craig and Hydaburg ended in April. At Craig the quota of 110 tons set by the Alaska Department of Fish and Game was reached in 10 hours of fishing, and at Hydaburg the quota of 50 tons was reached in 6 hours. This year 7 packers participated in the fishery as against 2 packers in 1963. Quota requests from processors to the Alaska Department of Fish and Game totaled more than 600 tons in 1964. Prices paid to pickers jumped from 5 to 6 cents a pound in 1963 to 15-20 cents a pound in 1964.

**Bureau of Commercial Fisheries Loan Program Takes Emergency Actions:** Under Secretary of the Interior James K. Carr met with the Regional Director for Alaska, Bureau of Commercial Fisheries, during his inspection trip to the areas affected by the earthquake disaster. Possible emergency actions that might be initiated and modifications of the Bureau's Fisheries Loan Program that could be affected to aid in recovery operations were discussed. With subsequent authority from the Secretary of the Interior, the Bureau opened an emergency office at Kodiak on April 10, under the supervision of the Chief of the Bureau's Branch of Loans and Grants.

The first emergency loan case was received on April 11 and approved on April 13 along with two other cases that were fully processed over that weekend. With additional personnel, offices were also manned at Anchorage, Seward, Cordova, and Valdez, for several days at each location. Personnel in that Branch's Seattle office also handled emergency loan cases to assist those who went south seeking replacement vessels, or repairs to damaged vessels.



In April 34 applications for loans (totaling over \$500,000) were handled in Alaska; 9 additional applications were being processed through the Seattle office. Throughout the month of May the affected areas were to be revisited and processing of loans was to continue as rapidly as possible. As many who lost vessels had not yet made firm plans to obtain replacement vessels, it was expected that applications would continue to be received sporadically for several more months.

**Exploratory Fishing Plans Completed:** Arrangements were made by the Bureau of Commercial Fisheries Branch of Exploratory Fishing to charter the halibut schooner *Paragon* starting May 18 at Seattle. Unless earthquake repercussions or other circumstances make it unfavorable, exploratory fishing personnel planned to conduct about 3 weeks of underwater television experiments from Port Wakefield. Those studies, starting on or about May 26, were planned to determine the feasibility concerning the use of television for locating and studying king crab. Follow-

At the hearing, sportsmen argued that commercial fishermen had already ruined the sardine industry and that the same thing would happen to the anchovies if the permits were granted. They said that the anchovy is the key to sport fishing in southern California and that without the anchovy as a forage fish, the bigger species such as yellowtail, barracuda, tuna, and albacore would have to migrate to more favorable waters toward Mexico.

The California Fish and Game Commission voted 5-0 against the commercial fishermen's request.

Note: See *Commercial Fisheries Review*, June 1964 p. 12.



## Cans--Shipments for Fishery Products

**January-December 1963:** The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during 1963 was down 6.9 percent from that

Table 1 - U. S. Domestic Shipments of Metal Cans for Fishery Products, 1963 and 1962  
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Fourth Quarter		Year	
	1963	1962	1963	1962	1963	1962	1963	1962	1963	1962
East/	155,814	158,531	215,924	189,556	276,572	341,193	173,532	191,087	821,842	880,367
Southern	21,010	13,403	38,197	32,668	34,986	21,765	33,673	30,269	127,866	98,105
North Central	29	63	5	29	8	22	29	26	71	140
West/2/	381,735	414,199	629,376	701,831	594,561	562,140	315,983	425,942	1,921,655	2,104,112
Total all areas	558,588	586,196	883,502	924,084	906,127	925,120	523,217	647,324	2,871,434	3,082,724

1/Includes Puerto Rico.

2/Includes Alaska and Hawaii.

ing in the experimental studies on king crab, it is planned that detailed shrimp exploration will continue off Kodiak Island and westward along the Alaska Peninsula.

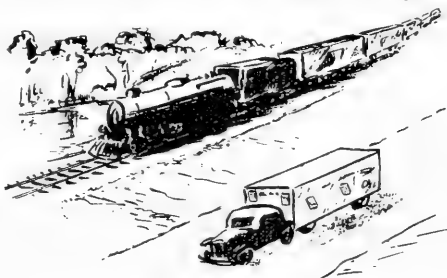


## California

### REQUEST FOR ANCHOVY INDUSTRIAL FISHERY DENIED:

A request by commercial fishermen of Monterey, Calif., to take 13,000 tons of anchovies for reduction into meal and oil was denied by the California State Fish and Game Commission. This was the result of a special meeting held on May 11, 1964, at Monterey so that public comments could be heard on the proposed experiment to fish for anchovies for reduction purposes, and whether or not permits should be granted to firms in the Monterey area for that purpose.

used during 1962. The decline was due to smaller shipments to the Eastern and Western Areas which were only partly offset by larger shipments to the Southern Area. The pack of salmon and tuna was down on the West Coast. A smaller pack of Maine sardines accounted for the decline in shipments to the East Coast. On the Gulf Coast, however, there was a considerable increase in the pack of shrimp.



**January-March 1964:** Shipments of cans for fishery products during January-March 1964 were 2.6 percent below shipments in the first quarter of 1963. A decline in shipments to the Western Area (due to a drop in the pack of tuna) was almost offset by larger shipments to the Eastern Area. East Coast canneries now packing tuna account for most of the increase in the Eastern Area.

Table 2 - U. S. Domestic Shipments of Metal Cans for Fishery Products, Jan.-March 1963 and 1964 (Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	1964	1963
East <sup>1</sup> .....	187,707	155,814
Southern.....	24,761	21,010
North Central.....	492	29
West <sup>2</sup> .....	359,947	381,735
Total all areas.....	572,907	558,588

<sup>1</sup>/Includes Puerto Rico.

<sup>2</sup>/Includes Alaska and Hawaii.

In January-March 1964, shipments to the Pacific or Western Area accounted for 62.8 percent of total shipments; shipments to the Eastern Area accounted for 32.8 percent; and shipments to the Southern Area accounted for most of the remaining 4.4 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans in 1964 are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

(2) See *Commercial Fisheries Review*, Jan. 1964 p. 9, April 1963 p. 15.



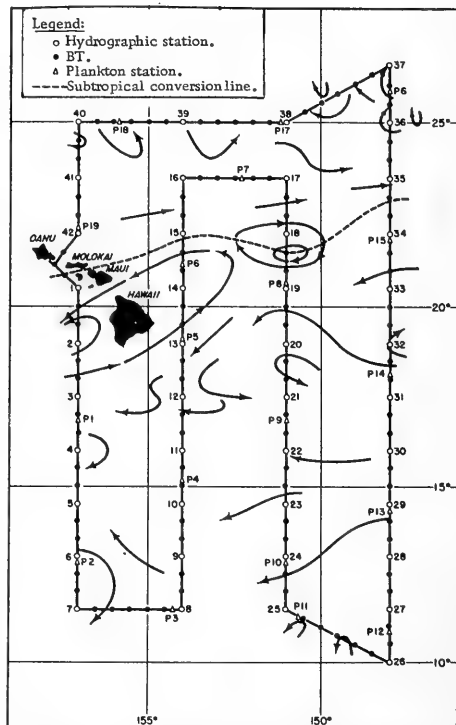
## Central Pacific Fisheries Investigations

### TRADE WIND ZONE

#### OCEANOGRAPHIC STUDIES CONTINUED:

##### M/V "Townsend Cromwell" Cruise 2

(March 16-April 5, 1964): To determine the rates of change in the distribution of oceanographic properties within the trade wind zone of the central North Pacific was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell. The cruise was one of a series designed to investigate the relation between wind and ocean currents. (Recent studies of the oceanographic climate of the Hawaiian Islands region have revealed that the southern boundary of the high salinity North Pacific Central water is seasonally



Cruise track of M/V Townsend Cromwell Cruise 2 (March 16-April 5, 1964), and flow patterns based on geostrophic interpretation of the distribution of the depth of the 200° C. isotherm.

displaced north-southward. Those surface water displacements are believed to be associated with seasonal changes in the trade wind system. In addition, the trade wind area is one of the most important energy transfer regions in the North Pacific and events there affect the whole North Pacific Central and North Pacific Equatorial circulation systems.)

During the cruise, 42 oceanographic stations were occupied. At each station temperatures and samples for salinity analysis were obtained at 20 depth points extending to 1,500 meters.

Bathythermograms were obtained at 30-mile intervals along the cruise track, and between selected stations (19-21, 26-28, and 35-37) bathythermograph casts were made at 10-mile intervals.

Surface temperatures and water samples for salinity analysis were obtained at each bathythermograph observation.

Bathythermograph data were coded and transmitted four times daily to the Fleet Numerical Weather Facility, Monterey, Calif.

At station 25, while drifting relative to a parachute drogue, subsurface currents were measured by means of a meter at depths of 10, 25, 50, 75, and 100 meters.

Sets of 10 plastic-enclosed drift cards were released at 30-mile intervals along the entire cruise track.

Standard marine weather observations were made and transmitted 4 times daily.

Radiation from sun and sky was measured and recorded daily by a pyrheliometer. Colored photographs of cloud formations were made.

Surface plankton tows of 30 minutes were made daily with a 1-meter net.

A standard watch for bird flocks and fish schools was maintained by vessel personnel during daylight hours. In addition, observers from the Smithsonian Institution maintained a watch for birds.

The chart shows, in addition to the cruise track, the ocean current pattern within the survey region as inferred from field plots of the distribution of the depths of the 20° C. (68° F.) isotherm. In general, the current pattern was similar to that previously obtained by the same method during Townsend Cromwell Cruise 1 (February 14-March 6, 1964). However, the large counterclockwise eddy found at approximately 13°-14° N. latitude between 150°-155° W. longitude on Cruise 1 was not seen on the Cruise 2 distribution. But two other flow patterns, not present during Cruise 1, were noted on the 20° C. isotherm chart for Cruise 2. Those flow patterns were: (1) a counterclockwise eddy at 18°-19° N. latitude between 148°-153° W. longitude, and (2) a clockwise eddy between stations 6 and 7. At the time of Cruise 2, the subtropical convergence east of the Hawaiian Islands was located at about the same position as during Cruise 1.

A total of 14 unidentified fish schools and 1 skipjack school were sighted during Cruise

2. Eleven of those schools, including the skipjack school were sighted south of 15° N. latitude. The remaining 4 schools were sighted in the vicinity of the Hawaiian Island chain.

Note: See *Commercial Fisheries Review*, May 1964 p. 13, Oct. 1963 p. 30.



## Federal Purchases of Fishery Products

### DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1964:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in April 1964 than in the previous month. The decline was 27.2 percent in quantity and 26.9 percent in value. Compared with the same month in the previous year, purchases in April 1964 were down 12.6 percent in quantity and 6.4 percent in value.

Total purchases in the first 4 months of 1964 were up 5.2 percent in quantity, but down 6.3 percent in value because of generally lower

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1964	1963	1964	1963	1964	1963	1964	1963
..... (1,000 Lbs.) .....				..... (\$1,000) .....			
1,734	1,985	8,524	8,102	903	965	4,458	4,757

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, April 1964 with Comparisons

Product	April		Jan.-April	
	1964	1963	1964	1963
<b>Shrimp:</b>	..... (Pounds) .....			
Raw headless	132,600	1/	414,650	1/
Peeled and deveined	44,986	1/	276,208	1/
Breaded	359,900	1/	1,454,100	1/
Total shrimp	537,486	432,371	2,144,958	2,059,004
Scallops	219,350	205,000	910,350	775,968
<b>Oysters:</b>				
Eastern	24,502	1/	351,420	1/
Pacific	19,314	1/	93,120	1/
Total oysters	43,816	82,345	444,540	431,867
Clams	16,500	19,470	136,858	99,170
<b>Filletts:</b>				
Cod	45,520	62,455	172,766	238,053
Flounder and sole	141,000	279,680	1,314,816	1,267,532
Haddock	99,530	164,850	2,677,424	849,070
Ocean perch	236,100	364,030	1,247,220	1,334,620
<b>Steaks:</b>				
Halibut	116,770	98,170	423,795	500,598
Salmon	15,675	18,390	64,977	69,925
Swordfish	700	2,050	6,010	11,230

1/Breakdown not available.

2/Includes 8,650 pounds of haddock portions.

prices. In January-April 1964 there were larger purchases of shrimp, scallops, clams, and flounder filets, but smaller purchases of cod filets, haddock filets, ocean perch filets, and halibut steaks.

Canned: In the first 4 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 88.2 percent in quantity and 87.1 per-

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April 1964 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan. -April		April		Jan. -April	
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	• • •	(1,000 Lbs.)	• • •		• • •	(\$1,000)	• • •	
Salmon	2	302	1,459	998	1	148	645	506
Sardine	-	-	679	6	-	-	416	4
	28	46	107	189	11	18	41	79

cent in value from those in the same period of the previous year. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, June 1964 p. 14.



## Gulf Exploratory Fishery Program

### SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 50--Phase I (April 16-24, 1964): To continue evaluation of the electrical shrimp trawl was the purpose of this cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. The main objectives were to determine the effectiveness of a mechanical tickler chain in conjunction with the electrical array during daylight fishing, and to evaluate the effectiveness of multiple mechanical ticklers.

Trawling tests were conducted off the Florida coast in the Apalachicola-Carrabelle area. Tows were made in St. George Sound behind Dog Island in 4 fathoms of water. The bottom type was soft mud. A 40-foot flat trawl with 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger as standard gear, and the experimental electrical trawl was fished simultaneously on the port side. Drags were of one hour duration. Tests were conducted both day and night. The night drags were

made principally to estimate the quantity of shrimp available in the area.

The three principal comparative evaluations made were: (1) daylight electric against daylight standard trawl; (2) daylight electric against night standard trawl; and (3) multiple mechanical ticklers against a single tickler chain.

Catch results from the 20 comparative daylight drags showed the electrical trawl averaged 77 percent more shrimp than the standard gear with the electrical gear always catching more than the standard. Daylight electric catches ranged from 7 to 19 pounds and averaged 12 pounds.

The daytime electric trawl catches averaged 10 percent less than night catches with the standard gear. Night catches from the 11 drags with standard gear ranged from 7 to 22 pounds and averaged 13 pounds.

The chain tickler behind the electrode array did not appear to improve catches on that type bottom.

Five comparative drags were made to obtain an indication of the effect of two mechanical tickler devices. On all of those drags, the experimental trawl caught less than the standard net indicating no improvement attributable to the double tickling action. The results of those drags were not used in the comparisons above.

M/V "George M. Bowers" Cruise 50--Phase II (May 6-12, 1964): To evaluate the handling characteristics and effectiveness of an electrical shrimp trawl equipped with transverse electrodes in place of the longitudinal electrode array used in previous tests was the primary objective of the second phase of Cruise 50. The vessel operated in the area off Carrabelle, Fla., and returned to port on May 12, 1964.

Dragging trials were conducted in St. George Sound behind Dog Island in 4 fathoms of water. The bottom type also was soft mud. A 40-foot semiballoon trawl with 6-foot by 30-inch doors rigged with a tickler chain was fished on the starboard side as a standard. The experimental gear was fished simultaneously on the port side and was identical except for the electrode array.

Generally, results were the same as achieved with the longitudinal array--daytime

catches with the electrical gear exceeded the daytime catches of the standard gear but were less than the average of the night standard gear catches. Also, night catches with the electrical gear were less than those of the standard gear.

The transverse electrode array design was easily handled with the standard shrimp-trawler rigging.

Further tests of the electrical gear, using a "frame trawl," will be conducted in St. Andrews Bay in the near future to determine: (1) vertical and horizontal escapement levels; (2) optimum electrode length; (3) optimum pulse rate; (4) optimum power level; and (5) relative effectiveness of longitudinal and transverse electrodes.

Note: See Commercial Fisheries Review, April 1964 p. 18.

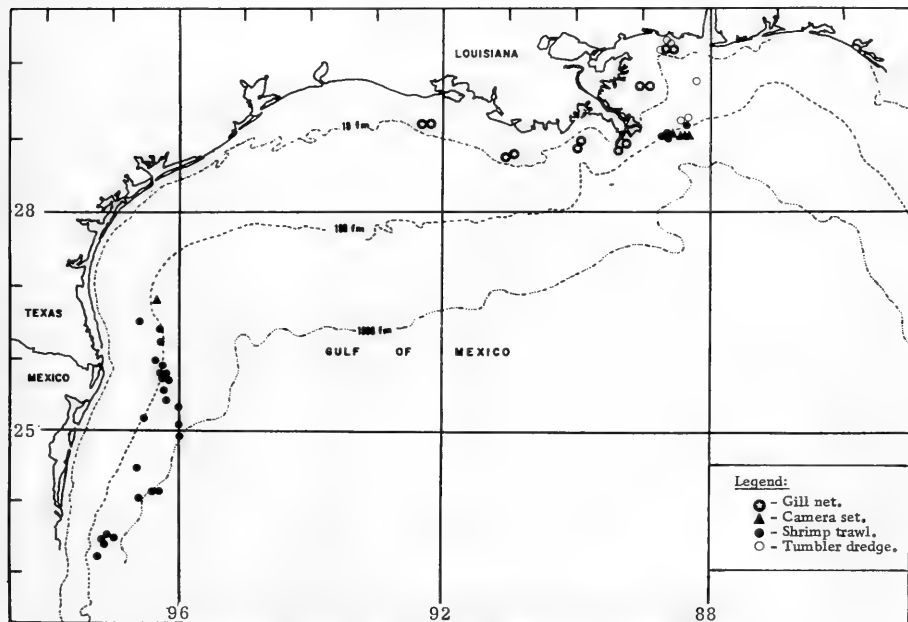
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#### SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO CONTINUED:

M/V "Oregon" Cruise 91 (March 30-April 17, 1964): The main objectives of this 18-

day cruise in the western and southwestern Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) make a preliminary systematic survey of the previously undelineated marine fauna of the international waters from Brownsville, Tex., to latitude 23° N.; (2) obtain motion picture coverage of fauna in the 200-225 depth range; (3) spot check the seasonal abundance of royal-red shrimp resources of the Mississippi Delta and Brownsville areas; and (4) continue investigations on off-season menhaden occurrences along the Mississippi, Louisiana, and Texas coasts.

A total of 24 deep-water faunal transects were made at 100-fathom intervals from 100 to 1,000 fathoms along the Continental Slope off Mexico. Deep-sea snapper (*Pristipomoides andersoni*) dominated catches from 100 fathoms. Hake (*Urophycis* sp.) and whiting (*Merluccius* sp.) were dominant in the 200-300-fathom depth range. Grenadiers (*Macrouridae*) were predominant in the deeper waters. Because of the unexplored nature of the offshore waters south of Brownsville, specimens collected in that area constituted new distri-



Areas investigated during Cruise 91 by the M/V Oregon (March 30-April 17, 1964).

bution records. Four 400-foot rolls of 16 millimeter film (2 color and 2 black and white) were exposed in the royal-red shrimp depths.

Royal-red shrimp catches from the grounds off Brownsville were very light. The best catches were made off the Mississippi Delta and consisted of 340 pounds of heads-on shrimp from three 3-hour drags in 220-225 fathoms.

Twelve gill-net stations were occupied. At each station, 6 bottom and 6 surface sets were made in depths ranging from 7 to 20 fathoms. The gill-nets used were of No. 7 monofilament nylon thread made up in four 300-foot sections of  $2\frac{5}{8}$ -,  $2\frac{3}{4}$ -,  $2\frac{7}{8}$ -, and 3-inch stretched mesh, and one 300-foot section of No. 69, 2-inch stretched multifilament. The catch of large-scale menhaden (*Brevoortia patronus*) consisted of 30 specimens caught in the surface sets and 23 taken in the bottom sets. (U. S. Bureau of Commercial Fisheries Beaufort Biological Laboratory personnel conducted 25 plankton tows to supplement the studies on Gulf menhaden.)

Other observations during the cruise included 18 bathythermograph casts made in conjunction with the deep-water faunal transects off the Mexican coast. A series of mud samples was collected from the royal-red shrimp grounds for tests of viscosity, adhe-

siveness, and friction. Six tumbler-dredge stations were occupied in various depths to collect live molluscs for study.

Note: See Commercial Fisheries Review, May 1964 p. 21.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-16 (April 14-26, 1964): Shrimp sampling in the northwestern Gulf of Mexico was continued during this cruise by the chartered research vessel Gus III operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. Standard 3-hour tows with a 45-foot shrimp trawl were made.

Although still light, catches were not as spotty as during the previous month's cruise in March 1964. During the April 1964 cruise, white shrimp were encountered in all statistical areas sampled, with the best catches being taken in under 10 fathoms. The best catches of brown shrimp occurred in the deeper waters.

Off Louisiana, area 14 yielded 24 pounds of 12-15 count brown shrimp from depths over 20 fathoms. Moving westward, a tow in area

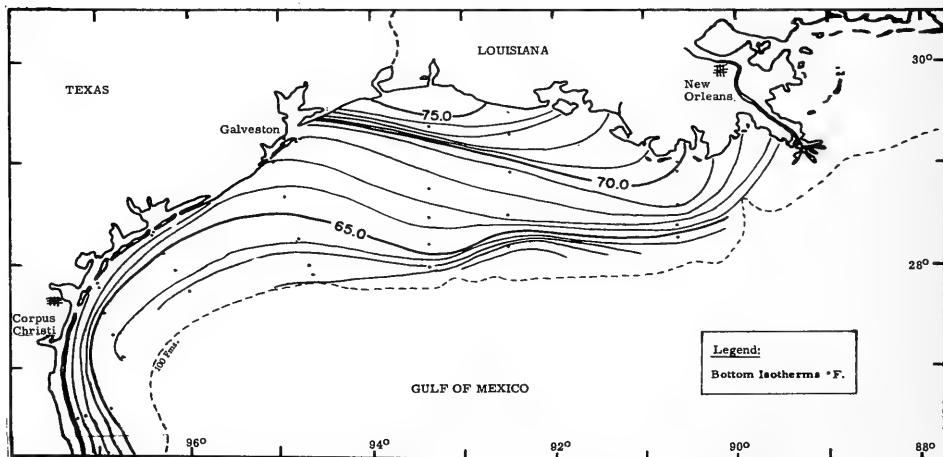


Fig. 1 - Bottom temperatures during M/V Gus III Cruise GUS 16 (April 14-26 1964).

16 produced 20 pounds of 21-25 count white shrimp from depths under 10 fathoms, and area 17 yielded 13 pounds of 26-30 count white shrimp from the depth under 10 fathoms.

Off the Texas coast, area 18 produced 12 pounds of 21-25 count brown shrimp from depths over 20 fathoms and 12 pounds of 31-40 count white shrimp from depths under 10 fathoms. In area 19, the 10-20 fathom range yielded 18 pounds of 26-30 count brown shrimp and 11 pounds of 15-20 count white shrimp. In area 21, a tow in 10-20 fathoms produced 24 pounds of 12-15 count brown shrimp.

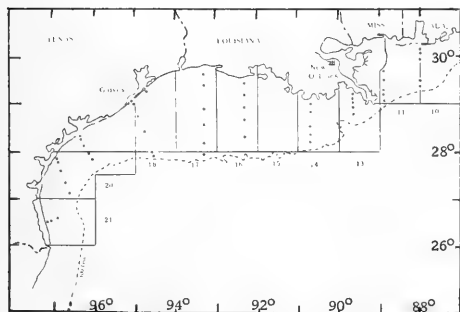


Fig. 2 - Station pattern for shrimp distribution studies.

A catch of 8 pounds of 51-67 count pink shrimp was taken from depths under 10 fathoms in area 20, but only traces of pink shrimp were found in tows made in other areas.

Oceanographic data collected during the cruise included 41 nansen bottle and bathythermograph casts. In addition, 41 oblique-step plankton tows, and 10 bottom plankton tows were completed.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See *Commercial Fisheries Review*, May 1964 p. 22.

\* \* \* \* \*

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during January-March 1964:

**SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies--Distribution and Abundance:** Examination of 84 plankton samples collected in January and February 1963 showed that although planktonic-stage penaeids were distributed over the entire sampling area, there was a marked decrease in abundance from the high noted in December 1962. Penaeids were slightly more abundant in the offshore waters between Galveston and Port Aransas, Tex., than in waters east or west of that general area.

Larval and postlarval shrimp of the genus *Penaeus* also decreased in numbers with the total catch being about 7 times lower in January and February 1963 than in December 1962.

Mysis and postlarval stages, most abundant at the 15-, 25-, and 40-fathom stations, constituted about 70 percent of the January catch, while in February 90 percent of the sample catch consisted of postlarvae which were most abundant at the 4-, 7½-, and 40-fathom stations.

To investigate the possibility that large concentrations of postlarval *Penaeus* sp. occur on the bottom just prior to their movement into nursery areas, a plankton "sled" was constructed and put into operation early in the quarter. This device consists of a Gulf-V plankton net mounted on ski-type runners. The mouth of the plankton net is about 1 foot off the bottom when the runners are on the bottom. Results of the "sled" tows appear quite promising and use of this gear will continue on an exploratory basis.

**Migrations, Growth, and Mortality of Pink Shrimp:** A third mark-recapture experiment was undertaken to obtain supplemental information on (1) rates of fishing and natural mortality in Tortugas pink shrimp stocks, (2) rate of growth as related to temperature, and (3) pattern of dispersal.



Fig. 1 - Shrimp being stained as part of the investigations on shrimp migrations.

Beginning on February 15, 1964, shrimp for marking were taken on the Tortugas grounds and delivered to a shore base at Stock Island (Key West), Fla. Those shrimp were measured, marked, and held for a few days before release over an area of 50 square miles

near the center of fishing activity on the Tortugas grounds. A total of 964 shrimp, measuring 118-128 millimeters (4.6-5.0 inches) in total length and marked with Trypan blue dye, were released on February 23; 1,392 shrimp measuring 115 millimeters (4.5 inches) or more in total length (approximate sizes retained by the shrimp fishery) and marked with fast green FCF dye, were released on February 24. All releases were made on the bottom by means of a release box. By March 20, a total of 256 recoveries had been verified.

Of 360 seabed drifters designed to measure the direction and speed of bottom currents and released on the Tortugas grounds with the marked shrimp, about 90 had been recovered by commercial fishermen as of April 1.

**Abundance and Distribution of Pink Shrimp Larvae:** Three sampling cruises were completed on the Tortugas shrimp grounds. Bottom temperatures on the first cruise (February 18 and 19) were about 18° to 19° C. (64.4° to 66.2° F.), and few or no pink shrimp larvae or postlarvae were taken.

During the period covered, material contained in 83 plankton samples was sorted and the penaeid shrimp counted and identified. This counting and sorting process has been facilitated by a new technique in which cupric ammonium sulfate is added to the sample to break up filamentous algae and detrital material in the samples. A tentative card format has been developed for computer analysis of plankton data.

The number of pink shrimp postlarvae sampled at the Buttonwood Canal bridge at Flamingo, Fla., was consistently found to be related to current velocity in the canal. When a plankton pump and a conventional plankton net were operated simultaneously, the plankton pump was found to catch more than twice as many pink shrimp postlarvae. (Conducted by University of Miami under contract.)

**Juvenile Phase of the Life History of the Pink Shrimp in Everglades National Park (Fla.) Nursery Grounds:** Routine sampling with the large channel net for juvenile shrimp in Buttonwood Canal, Fla., continued. The use of wing nets as comparative sampling devices was discontinued because of a lack of good correlation between catches by the wing nets and the channel net. The first field tests with a new conical net to determine the distribution of shrimp in the canal have proved promising. Since very few shrimp have been caught during flooding currents, sampling at that tidal stage will in the future be undertaken seasonally rather than monthly.

The U. S. Weather Bureau has installed a recording barometer at Flamingo, Fla., and the data from that facility will now provide the opportunity to determine whether or not there is a relationship between shrimp movement in the canal and barometric pressure. (Conducted by University of Miami under contract.)

**Seasonal Distribution Patterns of Adult and Larval Shrimp in Aransas Pass (Tex.) Inlet:** The "tide-trap" data for May 1963 to March 1964 have been summarized. Peaks in the total biomass moving through Aransas Pass occur during the spring and fall transition periods. In the spring, water temperatures rise and water levels are high, whereas in the fall temperatures and levels both decline. Greatest seaward movement of juvenile brown shrimp and the less abundant pink shrimp usually occurred at the full moon.

Seasonally, both species were most abundant in the Pass from the first week of May through June. Neither was collected between the middle of December and the first of May.

Postlarval brown shrimp moved from the Gulf of Mexico through the Pass in maximum numbers during April, May, and early June. The greatest number of pink shrimp postlarvae was noted in August and September. The two species occurred in about equal numbers in late June, July, and early August. None was found between October and January. White shrimp postlarvae were noted only occasionally. (Conducted by Institute of Marine Science, University of Texas, under contract.)

**SHRIMP DYNAMICS PROGRAM: Surveys of Post-larval Abundance and Fisheries for Bait (Juvenile) Shrimp:** Weekly and semiweekly sampling to determine the abundance of postlarval shrimp as they move through Sabine Pass and Galveston Entrance (Bolivar), respectively, continued during the period covered. In addition to those collected at the shore-zone station, samples were also obtained concurrently at two deep-water stations established in the entrance to Galveston Bay. A 12-inch Clarke-Bumpus net was used at the deep-water stations being fished at the surface and just off the bottom.

No postlarval penaeid shrimp were caught at the Bolivar station during January. A few (19) were taken in February. The first postlarvae collected this season at the Sabine Pass station were taken on March 18. It appeared that a later-than-usual movement of postlarval penaeid shrimp into Galveston Bay occurred this year. All specimens taken during the period were identified as brown shrimp (*Penaeus aztecus*).

For the first time since extensive statistical coverage was initiated in 1959, no shrimp were taken for bait from Galveston Bay during January. Final totals for last year indicate that while bait shrimp production decreased by 6 percent in 1963, the average catch per unit of effort increased by 13 percent.

Year	Catch	Fishing Effort	Average Catch Per Hour
	Lbs.	Hrs.	Lbs.
1963	1,994,600	29,120	34
1962	1,062,900	33,620	31

**Commercial Catch Sampling:** The normal late-winter period of low shrimp production along the Texas and Louisiana coasts provided an opportunity to analyze data previously collected in those areas. Maps illustrating the spatial distribution of catch and effort in the Texas brown shrimp fishery were constructed for the period August-December 1963. The maps are to be used to relate fishing intensity to changes in shrimp density. Data collected were used to compare statistics of relative size composition of shrimp as determined by the box and machine methods of grading. Results indicated that the two processes give similar results when large numbers of landings are compared. During some parts of the year, however, the reported size composition was found to be biased, presumably as a result of marketing practices.

A canvass of vessels fishing on the Tortugas grounds was continued during the period. Information relative to catch, effort, fishing area, and discards of small shrimp was obtained from more than half of the fishing fleet landing its catch at Key West, Fla. Three trips were made by Bureau personnel on commercial shrimp vessels to obtain data concerning the size of shrimp culled at sea



**Migrations, Growth, and Mortality of Brown and White Shrimp:** The brown shrimp mark-recapture experiment undertaken off the Mississippi coast in June 1963 was ended, with 429 (9 percent) of the 4,801 stained shrimp recovered. Inspection of the recovery pattern indicated little dispersion of the marked group from its general area of release. Calculations of fishing effort expended in the study area during the study period (June-August 1963) were completed. Examination of the effort indicated that it varied with time and followed a downward trend.

Of the 3,115 stained white shrimp released in Galveston Bay in August 1963, 412 (13 percent) have been returned. Work was completed on the tabulation and calculation of fishing effort expended in the study area. Fishing effort was found to vary with time and declined slowly in magnitude from mid-August through September 1963. Preliminary evaluation of mortality per 10-day interval yielded values of 15 percent for natural mortality and 10 to 18 percent for fishing mortality.

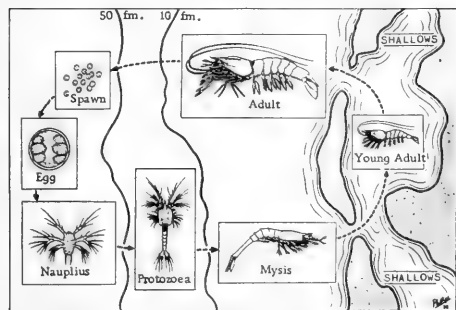


Fig. 2 - Diagram of the life cycle of the white shrimp (*Penaeus setiferus*).

The most direct means presently used for estimating the growth of shrimp is by mark-recapture experiments using biological stains as marks. Because biological stains concentrate in the gills, the question has arisen as to whether or not the stain affects oxygen uptake and, subsequently, metabolism and growth. To answer that question, a series of laboratory experiments was initiated in which the oxygen uptake of whole individuals as well as gill tissue from stained and unmarked shrimp was measured. If the oxygen uptake of stained individuals proved lower than that of unstained shrimp, it could be assumed that stains retard growth. Preliminary results from those experiments indicate no difference in oxygen uptake between stained and unstained shrimp.

**Population Dynamics:** Studies related to the selective characteristics of shrimp nets and those concerned with the relative fishing power of shrimp vessels were continued. Measurements of a large number of shrimp collected during net trials in fall 1963 were completed. Results from those experiments show that significantly fewer shrimp escape from the body of shrimp nets than from the cod ends. But when nets with meshes as large as  $2\frac{1}{2}$  inches and 3 inches (stretched mesh) are used, about one-third and two-thirds of the 40-count shrimp encountered escape from the body of the net. Almost no marketable shrimp (less than 68 count) escape from nets with meshes measuring  $1\frac{1}{2}$  and 2 inches, the sizes commonly used by commercial fishermen.

An improved method for processing data required to evaluate the comparative fishing power of shrimp boats has been developed. The procedure now in use will make it feasible to compare boats fishing in different geographic areas and on different species of shrimp.

**The Seasonal, Occurrence, Distribution, and Abundance of Postlarval Brown and White Shrimp in Vermilion Bay (La.):** Beam-trawl sampling of postlarval Penaeidae was continued. Three stations were occupied biweekly, a fourth station once a week, and the remainder not at all. Certain stations were not checked according to schedule due to inaccessibility resulting from rough-water conditions. Postlarval brown shrimp first appeared in samples taken on February 24, 1964, at the station in Southwest Pass. (Conducted by University of Southwestern Louisiana under contract.)

**Abundance of Postlarval Shrimp in Mississippi Sound and Adjacent Waters:** As of the end of March 1964, identification of all postlarval shrimp taken during the study was completed. Specimens in 636 samples included 37,250 penaeids belonging to one of the three major commercial species. Of those, 5,257 were classed as juveniles. Specific composition of the inshore postlarval collections (November 1962-October 1963) and the 1962 commercial landings from Mississippi Sound (Area 011.1) are shown in table.

Item	Total	Percent		
		Brown	White	Pink
Commercial landings, 1962 (Headless) in lbs.	201,662	61.0	31.9	6.9
Postlarvae at inshore stations (Nov. 1962-Oct. 1963) no.	25,974	61.3	32.3	6.3

Brown shrimp postlarvae appeared early in February this year and sampling was increased immediately. Some offshore island stations were eliminated and two stations were added to extend the sampling to the mouth of Tchoutacabouffa River. Numbers of postlarvae increased rapidly through March. The average catch at stations sampled in both years was more than twice that of the corresponding period in 1963. (Conducted by Gulf Coast Research Laboratory under contract.)

**ESTUARINE PROGRAM:** Ecology of Western Gulf Estuaries: Systematic data collection according to the plan initiated in January 1963 was refined following completion of sampling operations in February 1964. The addition of 3 marsh stations and 6 plankton stations should provide better biological coverage of the Galveston Bay system, whereas the inclusion of dissolved oxygen, total nitrogen, and phosphate measurements at 40 of the previously established hydrology stations will enhance the water-quality aspects of the overall study. Sampling with small trawls will continue on a monthly basis at 64 of the original 65 stations. Recent acquisition by the Bureau of Commercial Fisheries of the research vessel Redfish (a 29-foot inboard cabin cruiser) is expected to greatly facilitate future sampling activity. This vessel was put into service on a trial basis in March and was to be completely outfitted and ready for extensive operation by mid-April 1964.

The total weight and numbers of organisms collected during the period were well below those of the previous quarter. This reduction is attributed to the low water temperatures sustained during January and February, averaging  $10.0^{\circ}$  and  $12.9^{\circ}$  C. ( $50.0^{\circ}$  and  $55.2^{\circ}$  F.), respectively. Temperatures during March increased

significantly, averaging 17.9° C. (64.2° F.), as did the quantity of trawl-caught individuals.

The Atlantic croaker was the dominant species taken in trawl samples throughout the system during the period. The bay anchovy persisted at about the same level as in the previous period. Adult white shrimp and blue crab, which were found in very small numbers during January and February in the deep-water channels, appeared to be slowly moving back into the bay in March. Gravid female blue crabs appeared in March for the first time since November 1963, while adult brown shrimp were very scarce throughout the period. An indication that menhaden had spawned, possibly in November or December, was confirmed by the appearance of large numbers of postlarvae in plankton samples collected during February and March.

Intensive sampling for postlarval brown shrimp throughout the Galveston estuary was initiated on a weekly basis early in March. It is scheduled to continue throughout the period of peak influx of postlarvae and until the young shrimp begin to enter the trawl catches as juveniles. The purpose of this study is to determine the rate of dispersion of postlarval shrimp throughout the system and to establish their relative abundance in the various habitats and areas within the system. As of March 11, 1964, brown shrimp postlarvae were in evidence in small numbers in East and Lower Galveston Bays. A gross examination of samples collected a week later indicated an increase in numbers in those two areas and dispersion throughout most of the estuary. Peak immigration, however, did not appear to have been reached by mid-March.

Number and average weight data for brown and white shrimp collected during 1963 were compiled in terms of unit of effort (5 minutes of trawling) and then grouped by subarea as well as habitat. On an annual basis (1963), the greatest abundance of white shrimp occurred in East Bay, followed in diminishing order by Trinity Bay, Upper Galveston Bay, Lower Galveston Bay, the mouth of the San Jacinto River, and the tidal pass at Galveston Entrance. East Bay also had the highest average catch of brown shrimp followed by Trinity Bay, the mouth of the San Jacinto River, Upper Galveston Bay, Lower Galveston Bay, and the tidal pass. The smallest shrimp, both white and brown, were taken in the upper bays (East and Trinity) while the largest individuals were caught near large oyster reefs in the lower bay areas, in the tidal pass, and in the adjacent Gulf of Mexico. The Gulf Intracoastal Waterway, adjacent to East Bay, yielded high catches of small white and brown shrimp, indicating it is a major transport system from the tidal pass and East Bay to thousands of acres of adjoining and connecting marshes.

The most important habitat for white shrimp seemed to be the system's tertiary bays and bayous as against other habitat types such as the open-water and shoreline areas of the larger bays. In contrast, average catches of brown shrimp from the shoreline areas of the larger bays were as good as those from the tertiary bays and bayous.

**INDUSTRIAL BOTTOMFISH FISHERY PROGRAM:**  
Life Histories of Central Gulf Bottomfish: Length and weight frequency distributions of Atlantic croaker collected during research as well as commercial vessel operations in Mobile Bay, Mississippi Sound, and in the Gulf east of the Mississippi River Delta revealed the presence of three distinctly separate size groups during October 1963. Fish in Mobile Bay and in Mis-

issippi Sound averaged 12 centimeters (4.7 inches) in total length and 15 grams (0.5 ounce) in weight, and were presumed to be 1 year old. Individuals collected from industrial bottomfish catches made on near-shore grounds (2 to 7 fathoms) in the Gulf averaged 17 centimeters (6.7 inches) and 50 grams (1.7 ounces), and were classified as 2-year-old and older fish. Specimens caught offshore in 15-40 fathoms averaged 20.0 centimeters (7.8 inches) and 83 grams (2.9 ounces), and are considered to have been 3 years old. It is therefore apparent that the fall fishery is dependent upon 2- and 3-year-old fish, while 1-year-old croaker remain largely unavailable. Three-year-old fish in offshore areas do not contribute significantly during the fall season.

Samples of juvenile fish collected in Mississippi Sound and adjacent estuaries during the fall and winter of 1963-64 by personnel of the Bureau of Commercial Fisheries Gulf Coast Research Laboratory working on the postlarval shrimp project were being examined for the presence of croaker. A total of 1,400 croaker taken in October and December 1963 during research vessel operations off the northern Gulf coast by biologists of the Bureau's Biological Laboratory at Galveston were processed for life history data.

**Commercial Catch Sampling:** The annual bottomfish landings by species in the Delta region during the 5-year period 1959-1963 is summarized in table.

Year	Croaker	Spot	Sea Trout 1/	Cutlassfish	All Other	Total
	(1,000 Tons)					
1963	25.2	3.7	2.3	1.4	7.0	39.6
1962	27.9	4.5	4.4	2.3	9.2	48.3
1961	22.4	4.3	2.1	2.3	7.2	38.3
1960	19.7	4.5	4.6	2.0	9.9	40.7
1959	20.9	5.6	3.5	1.2	11.4	42.6
Average	23.2	4.5	3.4	1.8	8.9	41.9
Percentage	56	11	8	4	21	-
1/Sand and silver.						

The industrial fish catch in 1963 (excluding menhaden) dropped 18 percent to about 39,600 tons. At four ports in Louisiana and Mississippi, 2,055 vessel landings represented a 29-percent decrease over 1962. Increased use of tuna, chicken parts, and beef and pork byproducts in canned petfoods was primarily responsible for the drop in the demand for fish. Competition from a growing number of other petfood companies also contributed to the decreased use of Gulf bottomfish. Increasing 6 percent from the previous year, the estimated catch of croaker in 1963 was 64 percent of the total of all fish landed. Spot accounted for 9 percent, sand and silver sea trout combined amounted to about 6 percent, while cutlassfish contributed nearly 4 percent.

Measurements of total catch, relative abundance, and total fishing effort have been completed for the north-central Gulf by month from 1959 through 1962. Analyses of the data according to subareas were partially completed.

**Distribution and Abundance of Western Gulf Bottomfish:** Processing of subsamples of fish collected during the regularly scheduled survey cruises continued. The finfish catch-per-unit-of-effort for 1963 discloses, as did the data for 1962, that the concentration of industrial-type bottomfish is much greater off Louisiana than off Texas.

Table 4 - Industrial-Type Bottomfish Catch Per-Unit-of-Effort, 1963

Area	Depth (Fathoms)				
	4	7	15	25	40
Texas	55	70	75	75	90
Louisiana (West of Mississippi River)	130	225	250	220	130

1/Trawling with 45-foot (flat), 2-inch mesh trawl with rollers.

Observations of an experimental group of Atlantic croaker held in a 28,000-gallon 18-foot high tank of recirculating sea water have indicated that the fish are usually more active when not near the bottom, and that they only infrequently leave the bottom, even during daylight hours, when the water temperature remains as low as it does during the winter season. It appears that the magnitude of their diurnal variation, with reference to the bottom, is related to water temperature. Distinct diurnal variation in sample catches of spot, a closely related species, was observed and studied during an offshore cruise.

Note: See Commercial Fisheries Review, March 1964 p. 17.



## Industrial Fishery Products

### U.S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, April 1964: Preliminary data on U.S. production of fish meal, oil, and solubles for April 1964 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production <sup>1/</sup> of Fish Meal, Oil, and Solubles by Areas, April 1964 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homogenized <sup>3/</sup>
	Short Tons	1,000 Pounds	..... (Short Tons) .....	
April 1964:				
East & Gulf Coasts	5,702	3,248	2,539	-
West Coast <sup>2/</sup>	2,625	382	1,575	-
Total	8,327	3,630	4,114	-
Jan.-Apr. 1964 Total	15,273	6,655	7,359	-
Jan.-Apr. 1963 Total	15,902	7,757	7,018	1,250

<sup>1/</sup>Does not include crab meal, shrimp meal, and liver oils.<sup>2/</sup>Includes American Samoa and Puerto Rico.<sup>3/</sup>Includes condensed fish.

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Production, February 1964: During February 1964, a total of 1,834 tons of fish meal and scrap and 236,000 pounds of marine animal oil was produced in the United States. Compared with February 1963 this was a decrease of 1,013 tons (35.6 percent) in meal production and 88,000 pounds (27.2 percent) in oil production.

The quantity of fish solubles manufactured in February 1964 amounted to 592 tons--631 tons less than in February 1963.

Production of tuna and mackerel meal amounted to 898 tons which accounted for about 48.0 percent of the February meal production. Oil from tuna and mackerel (120,000 pounds) comprised 50.8 percent of the February oil production.

U.S. Production of Fish Meal, Oil, and Solubles, February 1964 <sup>1/</sup> with Comparisons				
Product	February 1/1964	1963	Jan.-Feb. 1964	Total 1963
	..... (Short Tons) .....			
<b>Fish Meal and Scrap:</b>				
Herring	2/	-	2/	2/
Menhaden <sup>3/</sup>	-	-	2/	181,750
Sardine, Pacific	-	-	1	-
Tuna and mackerel	898	2,222	2,022	3,930
Unclassified	936	625	1,706	25,208
Total	1,834	2,847	3,729	5,132
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/
Grand total meal and scrap	4/	4/	4/	4/
<b>Fish Solubles:</b>				
Menhaden	2/	-	2/	-
Other	592	1,223	1,882	2,595
Total	592	1,223	1,882	2,595
Homogenized condensed fish	-	-	-	50
Total	-	-	-	7,224
<b>Oil Body:</b>				
Herring	2/	-	2/	2/
Menhaden <sup>3/</sup>	-	-	2/	5,709
Sardine, Pacific	-	-	-	167,635
Tuna and mackerel	120	254	577	544
Other (including whale)	116	70	368	204
Total oil	236	324	945	748

<sup>1/</sup>Preliminary data.<sup>2/</sup>Included with unclassified.<sup>3/</sup>Includes a small quantity of thread herring.<sup>4/</sup>Not available on a monthly basis.

## Maine Sardines

### CANNED STOCKS, APRIL 1, 1964:

Canners' stocks of Maine sardines on April 1, 1964, were 41,000 cases less than those on hand April 1, 1963, but were 613,000 cases above stocks on hand two years ago on April 1, 1962 (the pack for the 1961 season was unusually small).

The 1963 season pack totaled 1,584,000 standard cases, according to the Maine Sardine Council. On April 15, 1963, carryover stocks at the canners' level amounted to about 660,000 cases. Adding the 1963 season pack results in a total supply of 2,244,000 cases as of April 1, 1964--up 4.4 percent from the total supply of 2,150,000 cases reported April

Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, April 1, 1964, with Comparisons

Type	Unit	1963/64 Season				1962/63 Season				1961/62 Season			
		4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62	7/1/62	6/1/62	4/1/62	1/1/62
Distributors	1,000 actual cases	291	261	308	217	215	264	271	230	134	99	148	193
Cannery	1,000 std. cases <sup>2</sup>	658	1,063	1,255	643	536	699	1,092	1,348	374	50	45	144

<sup>1</sup>/Table represents marketing season from November 1-October 31.

<sup>2</sup>/100 3½-oz. cans equal one standard case.

Note: Beginning with the Canned Food Report of April 1, 1963, U. S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.

Source: U. S. Bureau of the Census, Canned Food Report, April 1, 1964.

1, 1963, and higher by 98.9 percent from the short supply of 1,128,000 cases of April 1, 1962.

Note: See Commercial Fisheries Review, March 1964 p. 22.



## Marketing

### EDIBLE FISHERY PRODUCTS, 1963:

The total supply of edible fishery products for 1963 (domestic catch plus imports) dropped about 3 percent below the record high of 1962. On a round-weight basis (as caught), United States imports of fishery products accounted for 45 percent of the edible supply and domestic landings accounted for 55 percent. This was a record high proportion for imports and a new low for United States fishery landings.

The 1963 edible fish landings by United States fishermen declined about 85 million pounds from 1962. Landings were sharply lower for salmon, whiting, ocean perch, Pacific mackerel, haddock, Maine herring, blue crab, and Pacific sardines. Increased landings of shrimp, king crab, and yellowtail flounder partially offset the declines. The United States landings of edible fish and shell fish have trended downward since 1950.

The United States per capita consumption of fishery products declined slightly to 10.6 pounds in 1963, and no appreciable change is in prospect for 1964.

United States holdings of fishery products in cold storage early in 1964 were a little above a year earlier, indicating an adequate supply until commercial landings increase seasonally. Stocks of frozen ocean perch and cod fillets and steaks were well above the same period last year and inventories of halibut and shrimp were substantially higher. Among the canned fishery products, shrimp and canned pink salmon stocks were larger than the same period a year earlier.

In general, retail prices of fishery products are more favorable for the American consumer than a year earlier. They were expected to hold about steady through the second quarter of 1964.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's May 1964 issue of the National Food Situation (NFS-108).



## Michigan

### SPORT FISH SURVEY IN GREAT LAKES WATERS:

An inventory of the sport fishing potential in Michigan's Great Lakes waters was begun in the spring of 1964 by the Michigan State Department of Conservation. The survey is part of a broader effort to develop an improved program of commercial and sport fisheries management of the inshore waters of the Great Lakes.

At the start, the inventory program was devoted to examining the backlog of available information, and to setting up a field crew for exploratory fishing. For the next several years, the exploratory team will carry on a systematic study of Great Lakes inshore waters to find new areas for sport fishing. (News Bulletin, Michigan Department of Conservation, April 23, 1964.)



## Minnesota

### REGULATIONS FOR FISH-PROCESSING ESTABLISHMENTS:

The Minnesota State Department of Agriculture published rules and regulations in early 1964 relating to fish-processing establishments. Included in the new rules and regulations are stipulations requiring a permit to process fish for sale at wholesale. The

permit must be renewed annually and the renewal is subject to satisfactory sanitary conditions of the plant. The regulations cover construction of buildings and structures, water supply, sanitary facilities and accommodations, processing equipment, operations and operating procedures, and health of personnel.



## National Fisheries Center and Aquarium

### DESIGN PROGRAM BEING PREPARED:

An architectural firm in Bryan, Tex., has been selected to prepare a design program for the National Fisheries Center and Aquarium to be built in Washington, D. C., the General Services Administration (GSA) and U. S. Department of the Interior announced on May 8, 1964. The Public Buildings Service of GSA negotiated a \$50,000 contract with the Texas architectural firm to prepare proposals for allocating facilities within the Fisheries Center for convenience of public viewing and operations.

The design program was expected to be completed by June 1964. After approval, the program would serve as the basis for architectural design of the Fisheries Center. The design will be done by two firms selected earlier. The design program will include recommendations for traffic access to the aquarium site in East Potomac Park, parking accommodations, and other aspects of site development at Hains Point, a short distance south of the Nation's Capitol. The program also will make recommendations for the placement of facilities according to their relationship within the Fisheries Center, such as the type and location of display areas, public viewing facilities, research laboratories, and feed rooms and water supply for aquatic animals.

The National Fisheries Center which will cost an estimated \$10 million and show about 1,300 different kinds of aquatic life is expected to be completed in late 1967. Legislation by Congress in 1962 which authorized the Fisheries Center requires that it be self-supporting. Construction and operations costs are to be paid from an admission charge to all except supervised youth groups.

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### RESEARCH FACILITIES TO BE EXTENSIVE:

The National Fisheries Center and Aquarium being designed for construction in Washington, D. C., will serve the dual function of an educational center and aquatic research institution. It promises to be outstanding in both fields, the U. S. Department of the Interior reported on May 10, 1964.

The self-supporting Fisheries Center will display one of the world's largest collections of aquatic life in near-natural habitat, ranging from dolphins to barnacles. Behind the scenes, but basic to operation of the Center, will be research accommodations for 32 scientists. They will be drawn from several agencies of the Federal Government, from private institutions and universities, and from foreign countries.

The National Fisheries Center will be operated by the Interior Department's Bureau of Sport Fisheries and Wildlife. Scientists of that Bureau will conduct research in genetics, reproduction, nutrition, fish diseases, experimental ecology, behavior of aquatic organisms, and production of antibiotics and chemicals by marine animals. Secretary of the Interior Stewart L. Udall said the broadly based research program is expected to make important contributions to the fishery sciences and to human health. Some of the studies may have application in national defense. The Office of Naval Research, for example, seeks answers to some of its most vexing problems through biological research on marine organisms. The studies may lead to better vessel design, more efficient underwater communications, and better protection against dangerous forms of sea life. Several other Government agencies have also been interviewed by the Acting Director of the Fisheries Center to learn how the new facility can serve their research programs.

The head of the Biology Branch, Office of Naval Research, proposed that the Fisheries Center include facilities for growing and maintaining marine invertebrates, such as squid and barnacles. He said a problem common to all such research is a shortage of healthy marine animals and plants for experiments. If the National Fisheries Center can help ease this shortage, he said, it would provide a valuable service to the country's scientific community. The squid is of special research importance because its large central nerve fiber permits a variety of experi-

ments. Also needed is a better supply of the Nubilis barnacle, because of its large muscle sheath.

The Hydrobiology Research Program of the Office of Naval Research is supporting more than 120 basic research projects in academic and industrial institutions in the United States and abroad. One of the most important quests is for ways to prevent the fouling of ships and underwater equipment. The Naval Research official said more than 2,000 marine plants and animals have been implicated as fouling pests. The cost to the U. S. Navy alone for protecting ships, waterfront structures, and other equipment from these pests is about \$100 million a year.

The continued development of new kinds of underwater equipment will further increase the cost. Both the military and industry are beginning to place large stationary structures on the bottom of the ocean, or close to the bottom. These include acoustic devices and other instruments for geophysical and marine biological exploration. Once the structures are submerged, it will be impossible in some cases to retrieve them for maintenance and repair. There will be no way to clean off accumulated marine organisms that could impair operation of the equipment. The solution appears to be in long-life protection against fouling. The research approach is to learn more about the steps or links in the chain of biological processes which govern the life of the offending organisms. Scientists hope that weak biological links can be found and that they will offer a key to control methods.

Another research objective is to find ways to repel or deter dangerous forms of marine life which hamper underwater and amphibious operations. Better protection is needed against sharks, barracuda, moray eels, and other carnivorous marine species. Researchers are also looking into the problem caused by a variety of poisonous organisms in the sea.

Scientists are trying to learn more about the ability of some marine organisms to emit light so this phenomenon can be controlled. During World War II, several ships were attacked because the wake of their propellers churned up the organisms and caused them to glow in the dark. The intensity and rate of biological light emission was also said to be a useful tool for measuring energy con-

version in living tissue. This information is acknowledged to be important to a variety of biomedical investigations. There is interest in the ability of some marine animals to navigate over long distances with extreme accuracy and in their ability to communicate efficiently with each other. The U. S. Navy hopes that by discovering the biological basis for these capabilities, it may be able to simulate some of the desirable features by mechanical or electronic means.

A marine species of particular interest is the dolphin, which has a remarkably well-developed natural sonar. The dolphin uses its echo-ranging ability to find food and to avoid obstructions in murky water. Some experiments indicate that it can even distinguish the shape and texture of hidden objects. It is generally conceded that the dolphin's natural sonar is far superior to the manmade version. The hydrodynamics of the dolphin also offers a promising field of research. The dolphin swims through water with an almost complete absence of drag. When researchers find out how, the answer may result in better design for both surface vessels and submarines.



Other areas of scientific interest include the ability of some aquatic organisms to dive deeply without the adverse effects sometimes suffered by human divers. There also is interest in the development of artificial gills to obtain oxygen from water, and the use of algae to purify air in underwater equipment.

The Acting Director of the National Fisheries Center said that the new facility will provide every possible assistance to the Office of Naval Research in reaching its research objectives.

Note: See Commercial Fisheries Review, May 1964 pp. 26 and 27; April 1964 p. 22.

## North Atlantic Fisheries.

Developments in the North Atlantic fisheries as reported by the U. S. Bureau of Commercial Fisheries North Atlantic Regional Office, Gloucester, Mass., May 13, 1964:

**SOVIET FISHING VESSELS RETURN TO NEW ENGLAND WATERS:** About 60 Soviet fishing vessels and support craft returned to the fishing grounds off New England during the last week in April 1964, after a winter during which few foreign vessels were seen. A total of 32 Soviet factory stern trawlers, 25 side trawlers, and 5 refrigerated fish transports were observed fishing for whiting 130 miles east of Nantucket Island. From 10 to 15 Soviet trawlers were also seen fishing for scup (porgy) off the coast of Virginia and North Carolina.

**HADDOCK AND WHITING ABUNDANCE ON GEORGES BANK HOLDING UP DESPITE HEAVIER FISHING:** Fishing vessels of 9 nations fished on Georges Bank during 1963. They were from Canada, U. S. S. R., Poland, Germany, Japan, Norway, Denmark, United Kingdom, and the United States. Despite such heavy fishing pressure, haddock stocks are holding up well, and the large 1963 year-class is expected to enter the fishery next year (1965). No evidence has been noted of a serious decrease in the abundance of whiting. Fluctuations in yellowtail flounder stocks, fished heavily by United States fishermen, do not appear to be closely related to fishing effort. Estimates of the abundance of various species of groundfish by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, Mass., are greatly facilitated because of the Bureau's new research vessel Albatross IV.

**SIGNAL USED TO INDICATE U. S. VESSEL IS FISHING:** United States vessels fishing close to the Soviet fishing fleet this summer are asked to display a basket in their rigging. It is the only signal Soviet vessels will recognize that another vessel is fishing and thereby yield the right of way.



## North Atlantic Fisheries Investigations

### NORTHERN EDGE OF GEORGES BANK SURVEYED:

M/V "Albatross IV" Cruise 64-6 (April 23-May 6, 1964): To obtain pictures of fish

on or near the bottom, to conduct a special sampling experiment, and to tag blackback flounders at the Northern Edge of Georges Bank was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 80 survey stations were completed on this cruise, 526 blackback flounders were tagged, 20 camera lowerings were made, and 400 haddock scales and 120 argentine otoliths were collected. A temperature-recording buoy was set near Block Island, and bathythermograph lowerings were made throughout the cruise.

The results of this survey by the Albatross IV will be known following further analysis of data collected. Films from the underwater camera showed that turbidity was a major problem in obtaining photographs of fish or bottom.

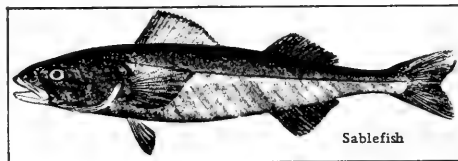
Note: See Commercial Fisheries Review, June 1964 p. 21.



## North Pacific Exploratory Fishery Program

### DEMERSAL FISH OFF SOUTHERN WASHINGTON SURVEYED:

An investigation of the demersal fish of the continental slope off southern Washington was started April 13, 1964, when the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb left her base at Seattle, Wash.



Sablefish

During the early phase of the investigation a series of tracklines was run to establish the bottom topography of the region and to determine areas where potential experimental fishing could be conducted. Some of the first experimental drags made at depths greater than 300 fathoms yielded catches of sablefish exceeding 1,200 pounds an hour. Relatively large concentrations of ocean perch were also found (3,000 pounds per hour tow) near the continental break at depths of about 105 fathoms.

## Oceanography

### OBSERVATIONS IN PACIFIC NORTHWEST COASTAL WATERS BY BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL:

M/V "George B. Kelez" Third Oceanographic Cruise: To develop a capability for handling and tracking buoys was the primary objective of this oceanographic cruise in Pacific Northwest coastal waters by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez. The vessel left her base at Seattle, Wash., on April 17, 1964, for this third scheduled cruise. Physical, chemical, and biological observations at a number of stations within 550 miles offshore of British Columbia, Washington, and Oregon, were to be made.



U. S. Bureau of Commercial Fisheries research vessel George B. Kelez.

The Kelez was to initiate a new project during this cruise--several free-drifting transponding telemetry buoys were to be released some 500 miles off the Pacific Northwest coast. It is anticipated that this new project will lead to the establishment of a system that will permit forecasts of coastal oceanographic conditions. During one phase of this cruise, the Kelez was scheduled to make closely-spaced oceanographic observations with the Oregon State University research vessel Acona.

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### BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL "GERONIMO" MAKES NEW DISCOVERIES:

The probable discovery of a new ocean current and the finding of an unusually "hot ocean area," were the results of a four-month

oceanographic research cruise (EQUALANT III) off the central west coast of Africa by the research vessel Geronimo, operated by the Washington, D. C., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. The discovery of a new ocean current is relatively rare with only a few having been found in the past 50 years.

Scientific personnel aboard the Geronimo had first indications of a westerly flowing undercurrent in the Gulf of Guinea in September 1963 when EQUALANT II (the second phase of the International Cooperative Investigations of the Tropical Atlantic) was being completed, and the Syncom II communications satellite transmitted oceanographic data for the first time. On that voyage, test equipment dropped from the vessel into the easterly flowing Guinean Current was unexpectedly pulled to the west at the end of long wires.

On the last cruise completed May 12, 1964, as part of EQUALANT III, the Geronimo went back to the Gulf of Guinea and obtained additional data which supports the probable existence of the newly discovered current. The Director of the Bureau's Biological Laboratory at Washington, D. C., said a current meter aboard the vessel did not function properly, but other measurements indicated that the undercurrent is from 50 to 80 feet below the ocean surface. He said no data have been obtained on the dimensions and velocity of the current but that further studies will probably be made in the fall of 1964 or the following spring.

The chief of the scientific group aboard the Geronimo on this recent voyage said the so-called ocean "hot spot" was found early in February 1964, and began about 30 miles southeast of Cape Three Points, Ghana. The hot ocean area measured about 60 miles in diameter and extended to a depth of about 30 feet. The water temperature in the area was 88° F., 6 degrees higher than the surrounding ocean. That warmer area was reported to be virtually without motion and may have resulted from a surrounding counter-clockwise eddy.

The Geronimo's chief scientist said there was an unusually large concentration of tuna at one point on the edge of the "hot spot," and that this apparently was associated with an adjacent upwelling of water from the ocean floor which brought nutrients to the surface. The "hot spot" disappeared 10 days after it was discovered by the Bureau's research ves-



sel. Further study is to be made in that area to learn if the heated water recurs. Tuna fishing in the area of the discovery is said to be traditionally good, and this may be related to a recurrence of the separate warmer water area.

Other oceanographic research vessels which participated in the most recent study of ocean currents and fishery resources in the area off the African Coast were sponsored by the University of Miami and the Governments of Ghana, Congo-Brazzaville, Spain, Republic of Ivory Coast, and the Soviet Union.

Note: See Commercial Fisheries Review, December 1963 pp. 37 and 60.

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#### TWO NEW ENGLAND UNIVERSITIES MAY ADD MARINE SCIENCE PROGRAMS:

The University of Massachusetts at Amherst has set up a commission to study the feasibility of establishing a fishery technology school. Also, the University of Maine is considering the addition of a marine laboratory. The plans of both schools have been discussed with the U. S. Bureau of Commercial Fisheries.

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#### RHODE ISLAND UNIVERSITY RECEIVES FUNDS FOR GRADUATE RESEARCH TRAINING GRANTS:

A total of \$166,380 has been awarded to the University of Rhode Island Graduate School of Oceanography by the National Institutes of Health to provide graduate research training grants, announced the dean of the University's Graduate School on May 21, 1964. It is the largest amount for that purpose ever received by the school.

Starting July 1, 1964, the grants will be used to provide financial support for 20 graduate students (mostly doctoral candidates) during the next five years. In addition, the funds will defray the costs of student training cruises aboard the University of Rhode Island research vessel *Trident*, the purchase of some equipment and supplies, and also help meet some of the Graduate School's operating costs through an "overhead" allowance. The School's dean said they "have been in considerable need of a financial assistance program for graduate students and that the lack of sufficient funds for that purpose has been an obstacle to enrolling many of the qualified students who apply each year."

There are now 41 graduate students at the School of Oceanography, who are assisted directly or indirectly by the University of Rhode Island, the National Defense Education Act, the U. S. Bureau of Commercial Fisheries, the Atomic Energy Commission, the Office of Naval Research, and others.

The grants by the National Institutes of Health will mean five additional students will be on campus the first and fifth years of the program. During the middle three years of the undertaking, 10 additional students each year will increase enrollments some 25 percent. Each will receive funds for the calendar year totaling \$3,000. It is expected the students will be on campus for two years each.

The dean of the Graduate School said that "oceanography has a direct bearing on public health problems. The inevitable direction of flow of all industrial and domestic wastes is into the estuarine and subsequently into the coastal marine environment. To understand how these wastes may be dissipated and perhaps converted, absorbed, or dispersed in the environment, requires broader knowledge of estuarine and coastal exchange, flushing, and their circulation processes."

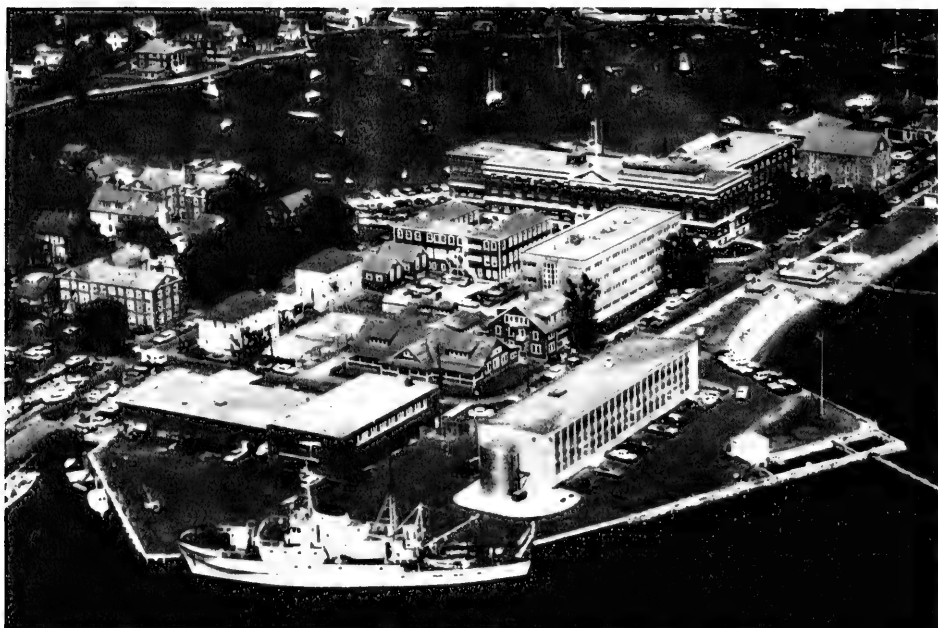
This latest training grant raises to more than \$1 million the amount received in grants by the Graduate School of Oceanography in a period of several weeks. Earlier the National Science Foundation had awarded \$850,000 to the School for the construction of a new laboratory-office building to be built on the University of Rhode Island Narragansett Bay Campus.

Note: See Commercial Fisheries Review, January 1964 p. 27.

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#### NEW RESEARCH LABORATORY DEDICATED AT WOODS HOLE OCEANOGRAPHIC INSTITUTION:

A new \$2-million research laboratory of the Woods Hole Oceanographic Institution was formally dedicated May 8, 1964, at Woods Hole, Mass. Named the Laboratory for Marine Sciences, the new 3-story building contains 45,000 square feet of floor space and was designed to accommodate the marine biology and chemistry departments of the Institution. Some of its special features include: 23 temperature- and humidity-controlled instrument rooms; 5 "environmental" rooms which can maintain any temperature from 0° to 40° C. (32° to 104° F.); rooms for frozen storage of



The modern building in the right foreground is the Woods Hole Biological Laboratory of the U. S. Bureau of Commercial Fisheries. To the left of the Laboratory is the Woods Hole Oceanographic Institute. The vessel in the foreground is the Albatross IV, the Federal Government's most modern fishery research vessel.

marine specimens; a large aquarium room with running sea water at regulated temperatures; a dissecting room; and an auditorium.

An afternoon session of the dedication was devoted to the presentation of papers by members of the Institution's scientific staff. The following papers were delivered: "The Organic Chemistry of a Fossil," "The North Atlantic Continental Shelf," "Diving and the Physiology of Marine Animals," and "Exchanges of Energy between Air and Sea." (Woods Hole Oceanographic Institution.)

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#### UNIVERSITY OF MIAMI RECEIVES NEW RESEARCH GRANTS FOR STUDIES IN MARINE BIOLOGY:

The National Science Foundation has awarded the Institute of Marine Science, University of Miami, a \$230,000 grant for research at sea aboard the Institute's 176-foot research vessel Pillsbury and aboard smaller

vessels of the Institute. The work will include collection and study of crustaceans and planktonic organisms from the Straits of Florida; studies on the migration and growth of marlin, sailfish, and other large oceanic fish, and the effect of the Gulf Stream upon their distribution; a study of squid and octopus, and shark investigations to determine their reaction to sounds played back into the water in the open ocean.

The Director of the Institute of Marine Science stated that the grant specifically provides for the cost of operating Institute ships for biological purposes as far afield as Brazil and West Africa, but also in Florida, Caribbean, and Bermuda waters.

Another grant, in the amount of \$62,500, was awarded to the Institute of Marine Science to provide special equipment for behavior studies of fish and invertebrates in the Institute's newly completed controlled environment building. The new equipment will

make it possible to keep fish, shellfish, and other experimental marine animals alive under a wide variety of accurately controlled conditions. Temperatures will be regulated to a fraction of a degree, while oxygen, salinity, light, and other variables can also be strictly controlled. In the new building, studies will be made on the reactions of fish to different types of light and sound, their hearing ability and color vision, their behavior under a variety of conditions including weightlessness, and the manner in which they orient to changing conditions. Work will also be carried out upon the reactions of commercial species of shrimp. (University of Miami, April 29, 1964.)

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#### NEW MARINE LABORATORY BUILDING PLANNED AT UNIVERSITY OF MIAMI:

A grant of \$1,040,000 from the National Science Foundation will make possible the construction of a new laboratory building for the Institute of Marine Science, University of Miami. The new building at the Institute will house the entire Division of Physical Sciences which carries out research upon currents, waves, tides, underwater sound and light, the chemistry of sea water and sediments, the topography and composition of the deep-sea floor, and other studies. With the construction of the new laboratory, many of the activities of those various research programs can now be concentrated in a single location.

To be completed and in use by the spring of 1965, the new laboratory will consist of 3 stories and will have about 30,000 square feet of working space. The ground floor will contain model basins and pressure tanks, including space for a rotating tank and a soundproof chamber. Tanks will be used for calibration of instruments and also to simulate some conditions of the open sea for experimental purposes. The second and third floors will house offices and laboratories, classrooms, a computer room, chartroom, draftroom, and a radio communications center for maintaining contact with the Institute's fleet of research vessels.

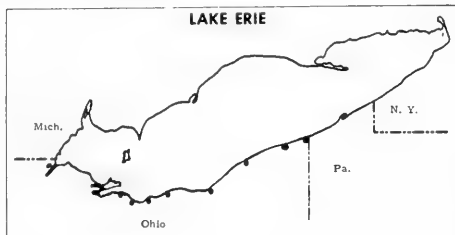
The President of the University of Miami stated that the new facility will allow certain Institute programs to make much more rapid progress than heretofore has been possible. (University of Miami, April 24, 1964.)



## Ohio

### COMMERCIAL FISHERY LANDINGS, 1963:

Commercial fish landings at Ohio ports of Lake Erie during the 1963 fishing season (March 15-December 20) totaled 14.2 million pounds, about one million pounds or 6.6 percent less than in 1962. There was an appreciable drop in landings of carp (2.5 million pounds) and yellow perch (4.5 million pounds) from the previous year, but landings of sheepshead (up 18 percent) and yellow pike (up 90 percent) increased.



Leading species landed in 1963 were yellow perch (4.5 million pounds), sheepshead (4.0 million), carp (2.5 million), catfish (1.0 million), white bass (1.0 million)--these accounted for about 90 percent of the total landings. Landings of blue pike and whitefish, once important commercial species in Lake Erie, were down to only a few hundred pounds.



## Oregon

### RECORD SILVER SALMON RELEASE FROM STATE HATCHERIES:

A record release of 10.4 million silver salmon yearlings from Oregon Fish Commission hatcheries during the liberation season from November 1963 to May 1964 has been announced by the Commission's fish culture director. Coastal areas received 2.3 million of the fish while 8.1 million went into Columbia and Willamette River tributaries.

In addition to the yearlings which were reared to seaward migrant size, some 10 million salmon fry (surplus to hatchery needs) were placed in selected streams, ponds, and lakes for natural rearing under "wild" conditions. Areas for liberation of zero-age fry were selected on the basis of fish production

potential after thorough biological investigation. That was in contrast to indiscriminate planting of fry which characterized fish-cultural operations in many places during earlier times when large numbers of newly hatched fry were dumped with little more basis than hope that they would survive.

This season's release of 10.4 million yearlings tops the previous record of 8.5 million silver salmon released last season by the Oregon Fish Commission. Emphasis during recent years on release of yearling fish ready for seaward migration appears to be playing an important role in the increasing success of the silver program, the Commission's fish culture director indicated. He reported increasing annual returns of adult silver salmon to the hatcheries totaled 22,544 in 1961, 36,107 in 1962, and 44,840 in 1963. He also cited improved disease control and superior nutrition during the year or more the fish are held in the hatcheries and good ocean survival conditions as factors in the success of the hatchery program. (Oregon Fish Commission, May 4, 1964.)

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#### FISH DISEASE STUDY CENTER OPENED:

The Oregon Fish Commission has established an Infectious Disease Study Section to investigate and control fish disease. The new unit will be directed by an expert in the field of medical research who will be assisted by a resident staff of five fisheries scientists. The section is housed principally in a new laboratory building at the Commission's Clackamas Research Center.

The fisheries disease work is divided, much as human investigation might be, into diagnostic and research areas. The diagnostic division at the laboratory is concerned principally with the diagnosis of disease in juvenile salmon and steelhead in hatcheries. Fishery scientists, in the role of medical examiners, determine the problem and prescribe treatment. Various antibiotics and drugs are administered through the diet by way of specially prepared pellet foods or by solutions introduced into the water in which the fish live.

Research in the infectious disease section deals primarily with controlling diseases in adult fish which return to Commission hatcheries to spawn. Most of the large fish are held in ponds until "ripe" and ready to re-

lease their eggs. In one species, the spring chinook, the holding period may be as long as 5 months, allowing ample opportunity for disease and parasitism to infect and kill the important parent fish. Treatment of spawners is mainly external as adult salmon ingest no food after returning to fresh water.

As hatcheries gain increasing importance in maintaining anadromous fish runs, the speedy diagnosis and control of disease assumes new consequence. As in human populations, the forced concentration of thousands of individual fish in a small area increases many fold the chance for epidemic outbreaks of disease. The new laboratory will be a formidable tool in removing causes of mortality in hatchery-reared salmon and steelhead. Close liaison is kept with the superintendents of Commission hatcheries to keep them aware of late developments, as well as to receive the earliest possible warnings of disease problems. Discoveries made in the Clackamas Laboratory could also lead to increased production in the many natural salmon spawning and rearing streams of the Northwest.

The fishery infectious disease center has specialized equipment and a unique spring water source. The Center has an elaborate water-temperature control system which can simultaneously supply 4 strong and continuous flows of water, each with its own precise water temperature of less than 1° F. variation and in a range of from 35° F. to above 100° F. Each of the 4 separately adjustable flows can supply a separate aquaria.

In conjunction with the Clackamas Center, Oregon Fish Commission contract research



on virus diseases and tissue culture is being carried on at Oregon State University. Six other Fish Commission research laboratories supplement the infectious disease investigations. A mobile diagnostic laboratory mounted on a truck should be ready for use later this year and will be equipped with the tools necessary for field study at the hatchery sites.

At present, 93 percent of the entire Oregon Fish Commission budget and 85 percent of its

research budget is spent on programs to enhance the runs of salmon and steelhead. (Oregon Fish Commission, May 4, 1964.)

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### FISH AND WILDLIFE KILLS BEING INVESTIGATED:

The opening of a field office and laboratory in Klamath Falls, Oreg., in June 1964, to investigate the cause of fish and wildlife kills in that area, was announced on May 21 by the U. S. Public Health Service, Department of Health, Education, and Welfare. The fish and wildlife deaths are believed to have been caused by the runoff of chemicals into the river basin or by agricultural practices in the area. There have also been reports of persons in the area contracting dermatitis, a skin irritation.

The investigation is to be handled by the Division of Water Supply and Pollution Control. Scientists will also study the area's algae growth, which has reportedly reached nuisance proportions. The complete study is expected to take four years and will also include the land areas drained by Lost River.

Headquarters for the project is in San Francisco, Calif., and preliminary work was begun there in December 1963. The project's work will be coordinated with the Corvallis Laboratory at Corvallis, Oreg. The project staff will consist of 8 engineers and scientists in the initial phase of the study (scheduled to begin in June) and entails data collection and analysis of the Klamath Lake and Lost River system.

The investigation was begun at the request of the U. S. Fish and Wildlife Service and the States of California and Oregon. It is to be operated in conjunction with work being done by the Fish and Wildlife Service.



## Salmon

### INDUSTRY-GOVERNMENT PROMOTION CAMPAIGN:

An industry-Government promotion campaign to move the liberal stocks of canned pink salmon into trade channels was announced by Secretary of the Interior Stewart L. Udall on May 15, 1964. The Department's Bureau of Commercial Fisheries will cooperate with

the Alaska canned salmon industry in the campaign. Fishing is Alaska's largest industry, Secretary Udall commented, and the American public can help boost Alaska's economic recovery from the March 27 earthquake by serving more canned salmon.

The nationwide campaign was geared to reach its peak during May, June, and July. Although record stocks of canned pink salmon are available, industry spokesmen are confident that the inventories can be substantially reduced because canned salmon fits so well in warm weather menus.

**plentiful foods**  
A MONTHLY MERCHANDISING GUIDE FOR FOOD DISTRIBUTORS

Feature  
**Milk and Dairy Products**  
**Other Plentiful**  
**Beef • Early Summer Vegetables • Canned Pink Salmon**

PP-36 (REVISED MAY 1964)  
USDA - AMS - Food Distribution Division, 536 South Clark St., Chicago, Ill.

With a supply of this versatile canned food on their shelves, housewives can provide their families with a variety of appetizing and quick and easy to prepare summer meals. In addition, they will find that canned pink salmon is an economical, no-waste, high-protein food that is an excellent source of vitamins, minerals and other nutrients. Budget-minded housewives will find that loaves, croquettes, and casserole dishes prepared from canned pink salmon are extremely practical, and tasty.

Secretary Udall said the Bureau of Commercial Fisheries will give special emphasis to canned pink salmon in its contacts with consumer groups, schools, other institutions, and the food trade associations. Special materials also are being prepared for distribution to newspapers and television and radio stations to provide maximum consumer attention to the availability of this convenient canned fishery product.

The U. S. Department of Agriculture also is cooperating in this promotional program,

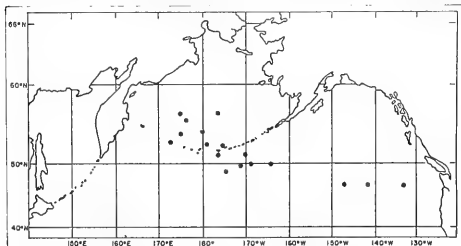
and canned pink salmon was listed in their June "List of Foods in Plentiful Supply." That Department also distributed specially designed merchandising tips to the retail grocery trade with the recommendation that increased merchandising attention be given canned pink salmon at the local level.

Note: Many attractive recipes are available to the homemaker in the Interior Department's full color 16-page recipe booklet, "Take a Can of Salmon," Fish and Wildlife Service Circular 60. As part of its contribution to this promotional campaign, the Canned Salmon Institute, Box 1200, Seattle, Wash., has supplies of this recipe booklet and will send a complimentary copy to interested homemakers. They are also available from the Superintendent of Documents, Washington, D. C. 20402, for 25 cents a copy, with a discount of 25 percent on individual orders of 100 copies or more.

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### NORTH PACIFIC WINTER DISTRIBUTION AND TAGGING:

M/V "George B. Kelez" Winter 1964 Cruise (January 17-March 18, 1964): To further delineate the winter distribution of salmon in the North Pacific Ocean and Bering Sea, tag individuals to determine migration routes and area of origin, and to compare the catch rates and selection properties of gill nets and floating longlines were the principal objectives of this three-months cruise by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez.



Fishing stations completed by the M/V George B. Kelez during the 1964 winter cruise, January 17-March 18, 1964.

Unusually severe weather conditions over the entire Aleutian region and ice limits further south than anticipated permitted only 16 fishing stations and necessitated modification of the planned cruise track.

Salmonids were taken at every station but in comparatively low numbers. With the exception of one chum salmon and a few pinks and steelhead at the easternmost three stations, the catches were exclusively sockeyes, 90 percent of which were large and possibly maturing.

Gill nets and long lines were fished simultaneously only twice and catches in both types of gear were too small for statistical comparison.

The total number of fish caught and tagged during the cruise were:

Species	Caught	Tagged
	... (Number of Fish) ...	
Salmon:		
Sockeye. ....	263	134
Chum. ....	1	0
Pink. ....	24	21
Steelhead. ....	18	15
Total. ....	306	170

At the termination of this cruise, the George B. Kelez returned to Seattle to be outfitted for an oceanography cruise scheduled for April 1964.

Note: See Commercial Fisheries Review, August 1963 p. 6.

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### NORTH PACIFIC HIGH-SEAS TAGGING PROJECT:

From 4 to 5 months of high-seas salmon tagging is to be undertaken by two purse seiners chartered by the U. S. Bureau of Commercial Fisheries, according to an April 1964 announcement by the Bureau's North Pacific Regional Office at Seattle, Wash. The vessels are the Commander and the Storm.

The areas to be covered will be (1) Central Gulf of Alaska; (2) Central Aleutians; (3) North-Central Gulf of Alaska; and (4) Coastal area of Northeast Gulf of Alaska. As part of the studies of salmon migration at sea, the Bureau's scientists aboard the vessels plan to experiment with sonic tags as a means of following the movements of individual salmon for 24 to 48 hours after tagging. This experiment will be conducted in connection with the vessel Storm in the area south of the Central Aleutians where the abundance of salmon is usually high and salmon movements are apparently directional.

The tag and hydrophone "sniffer" used will be of the type developed by the Bureau's Fish Passage Program. Of interest will be the rate of travel of the salmon, direction of movements, and reactions to tide changes and darkness. It is possible the fish will "mill" for some time due to the effects of tagging. Small boats from the Storm will be used to track the sonic-tagged salmon. The tests will be repeated as often as practicable.



## South Atlantic Exploratory Fishery Program

### EXPLORATORY TRAWLING OFF NORTH AND SOUTH CAROLINA CONTINUED:

M/V "Silver Bay" Cruise 56 (March 30-April 20, 1964): To conduct basic and seasonal trawling surveys off Long, Onslow, and Raleigh Bays was the main objective of this 22-day cruise off North Carolina and South Carolina by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. A total of 88 exploratory fishing stations was occupied between 5 and 100 fathoms. Exploratory gear consisted primarily of 50/70-foot, nylon, roller-rigged fish trawls fished on 8-foot bracket doors with 15-foot leg lines. The trawl nets were  $4\frac{1}{2}$ -inch mesh with cod ends of  $1\frac{1}{2}$ -inch mesh.

LONG BAY: In Long Bay, 36 trawling stations were occupied. In depths of less than 20 fathoms, catches were dominated by small numbers of scup (*Stenotomus* sp.), sea robins (*Prionotus* sp.), and miscellaneous sharks and rays. In 20 to 25 fathoms, all catches were dominated by filefish (*Stephanolepis hispidus*), which were taken in amounts up to 9,000 pounds per 90-minute drag. Snappers and grouper were taken at several locations between 26 and 40 fathoms. One area where dragging was productive is located at  $33^{\circ}11'$  N. latitude,  $77^{\circ}30'$  W. longitude in 29 fathoms. Two drags on this "lump" produced an average of 400 pounds of grouper, 300 pounds of gray triggerfish (*Balistes capricus*), 90 pounds of snapper, 50 pounds of hogfish (*Lachnolaimus maximus*), and 20 pounds of white porgy (*Calamus* sp.), for an average of 860 pounds of fish per drag. The grouper catches

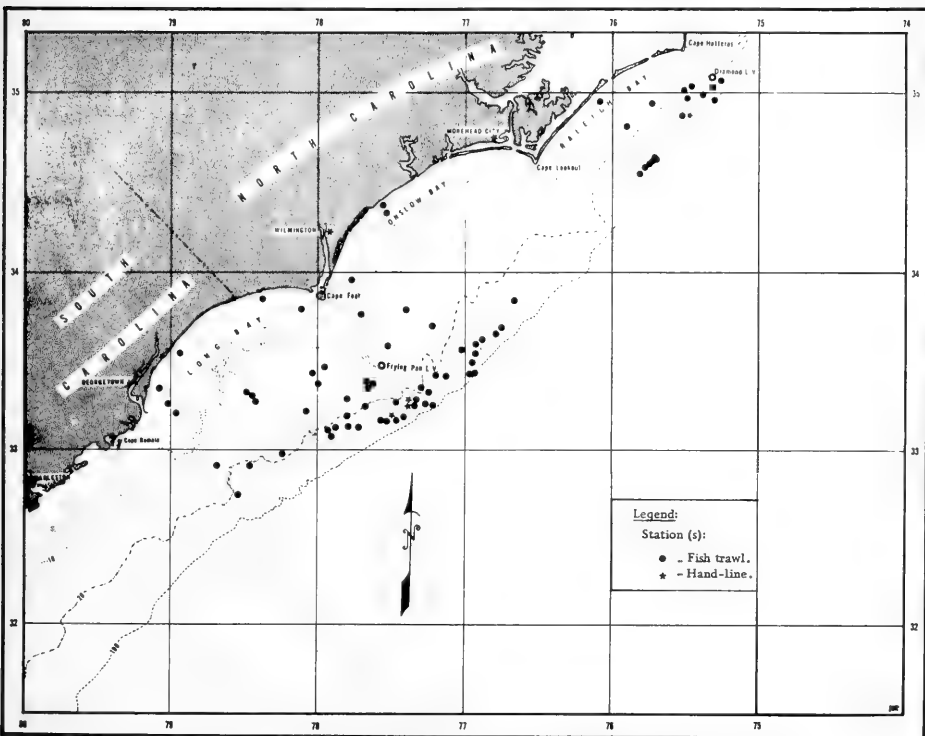


Fig. 1 - Shows the station pattern for Cruise 56 of the M/V Silver Bay, March 30-April 20, 1964.

consisted of gag (*Mycteroperca microlepis*), scamp (*M. phenax*), and red hind (*Epinephelus guttatus*). The snapper catches consisted of red snapper (*Lutjanus aya*), yelloweye snapper (*L. vivanus*), mutton snapper (*L. analis*), black fin snapper (*L. buccanella*), and yellow tail snapper (*Ocyurus chrysurus*).

**ONSLow BAY:** In ONSlow Bay, 31 stations were occupied for trawl or hand-line operations. Due to weather conditions, only the southwest portion of the bay was surveyed. In depths of less than 25 fathoms, the catches were generally unproductive and, again, were dominated by filefish. Heavy concentrations of fish were observed in 30 fathoms south-east of Frying Pan Light Ship 33°15' N. latitude, 77°22' W. longitude. Trawling was generally unsuccessful in that area due to rough bottom, but both trawling and hand-lining produced modest amounts of red snapper, hogfish, grouper, and greater amberjack (*Seriola dumerili*).

**RALEIGH BAY:** Although explorations were greatly hampered by weather, 21 sta-

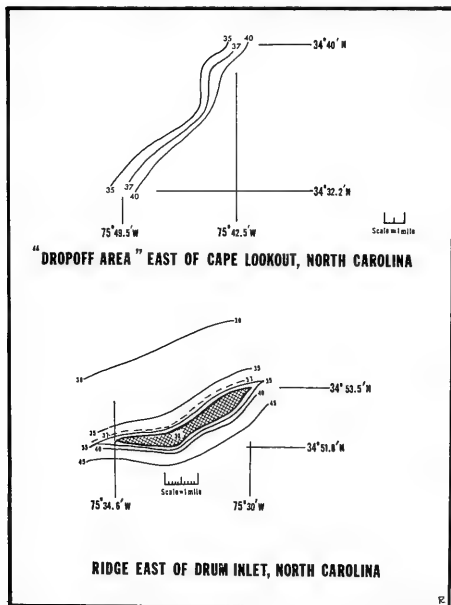


Fig. 2 - Shows 2 locations off Raleigh Bay where heavy concentrations of bottomfish were located during Cruise 56 of the M/V Silver Bay.

tions were occupied in Raleigh Bay. Catches inside 25 fathoms were dominated by sharks, rays, and northern puffers (*Sphaeroides maculatus*). One drag east-southeast of Ocracoke Inlet in 17 fathoms produced 65 pounds of small (1 to 4 fish per pound) summer flounder (*Paralichthys dentatus*).

Extremely heavy concentrations of bottomfish were recorded at three locations in 30 to 40 fathoms near the edge of the Continental Shelf. The first of those areas consists of a small spot of broken bottom at 34°59.5' N. latitude, 75°24' W. longitude in 37 fathoms where the only drag made resulted in a damaged trawl. The catch consisted of 35 pounds of medium-size black sea bass (*Centropristis striatis*). The second area is a ridge, 4 miles in length, which shoals to 30 fathoms from a depth of 37 fathoms due east of Drum Inlet (fig. 2). Heavy concentrations of bottomfish were observed on the sides and over most of the top of the ridge. The bottom was not trawlable with the exploratory gear used, but small catches taken by hand-line were composed of black sea-bass, red snapper, and pink porgy (*Pagrus*). The third area consists of a ridge formed by a sharp dropoff in bottom contour from the 35- to 40-fathom curve due east of Cape Lookout (fig. 2). Heavy concentrations of fish shoals were recorded between 37 and 40 fathoms along the entire length of that 10-mile ridge. Recordings indicate that several species of fish were probably present. Again, difficult trawling conditions were encountered, but small amounts of red snapper and pink porgy were taken. The catches also indicated that some of the fish schools in the area were small (4 to 8 fish per pound) vermilion snapper (*Rhomboplites aurorubens*).

Throughout the survey area, catches of commercially important fish were made where bottom temperatures ranged from approximately 56° to 59° F.

Note: See *Commercial Fisheries Review*, April 1963 p. 25.



## Shrimp

### UNITED STATES SHRIMP SUPPLY INDICATORS, APRIL 1964:

Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off) .....					
Total landings, So. Atl. and Gulf States:					
June .....	-	4,427	3,358	3,171	4,728
May .....	-	10,152	6,186	5,276	6,335
(Table continued on next page.)					



Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off) .....					
April .....	4,800	4,427	3,358	3,171	4,728
March .....	4,269	3,632	3,331	4,754	4,099
January-February .....	10,409	7,979	7,963	9,596	9,186
January-December .....	-	138,281	105,839	91,396	141,035

Quantity canned, Gulf States 1/:					
June .....	-	5,234	4,913	3,438	6,920
May .....	-	3,831	1,794	1,208	1,461
April .....	-	105	12	9	66
March .....	12	92	86	35	117
January-February .....	634	750	733	273	470
January-December .....	-	29,468	23,322	14,500	26,394

Frozen inventories (as of end of each mo.) 2/:					
June 30 .....	-	24,047	13,796	19,416	15,338
May 31 .....	-	24,053	13,904	24,696	17,540
April 30 .....	-	24,954	15,637	27,492	20,502
March 31 .....	31,476	27,970	16,607	31,345	23,232
February 29 .....	35,303	28,039	19,012	37,612	29,063
January 31 .....	43,752	28,487	21,328	37,842	34,332
January 1 .....	45,335	31,577	19,755	40,913	37,866

Imports 3/:					
June .....	-	9,439	9,397	8,065	8,932
May .....	-	11,110	11,020	8,278	9,902
April .....	-	11,082	10,210	9,208	7,733
March .....	12,777	13,616	9,658	10,347	8,545
January-February .....	24,962	25,239	23,506	21,270	16,253
January-December .....	-	151,530	141,103	126,268	113,418

Ex-vessel price, all species, So. Atl. and Gulf Ports:					
June .....	-	77.0	84.4	53.7	64.1
May .....	-	80.9	83.7	52.8	62.9
April .....	4/57-61	83.6	82.2	55.4	60.6
March .....	4/57-61	85.5	80.9	56.0	56.3
February .....	4/57-62	85.7	78.9	53.5	51.8
January .....	4/57-69	85.0	76.3	52.5	49.5

Wholesale price, froz. brown (5-lb. pkg.) Chicago, Ill.:					
June .....	-	95-102	102-104	87-92	76-77
May .....	-	100-103	96-103	67-69	74-77
April .....	72-74	100-105	94-97	69-70	74-75
March .....	72-75	102-106	94-95	69-71	65-68
February .....	73-82	102-106	93-95	69-71	65-67
January .....	78-83	102-106	91-94	69-71	64-66

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.	
2/Raw headless only; excludes breaded, peeled and deveined, etc.	
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.	
4/Range in price at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.	
Note: April 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.	



## Sport Fishing

### LICENSE SALES INCREASED IN 1963:

A total of 19,831,644 persons in 50 states bought sport fishing licenses in fiscal year 1963 (July-June) as compared with 19,403,465 in fiscal year 1962, the U. S. Department of the Interior announced on April 20, 1964. In 1963 they spent \$57,780,259 to buy the licenses as compared with \$54,163,163 in 1962.

The state game and fish departments provide license holder and sales information to

Summary of the Number of Paid Fishing License Holders, License Sales, and the Cost to Fishermen in the United States, July 1, 1962 to June 30, 1963.

State	Paid Fishing License Holders <sup>1/</sup>	Fishing Licenses, Tags, Permits, and Stamps Issued	Gross Cost to Fishermen
Alabama	393,635	393,635	\$ 832,589
Alaska	58,844	363,771	347,775
Arizona	226,947	311,605	859,020
Arkansas	435,956	435,956	1,155,150
California	1,611,639	3,823,431	6,839,903
Colorado	440,669	445,362	1,604,313
Connecticut	111,845	111,845	433,759
Delaware	9,644	10,761	27,821
Florida	496,923	517,251	1,098,353
Georgia	530,722	555,911	716,706
Hawaii	4,264	4,264	9,496
Idaho	279,070	321,641	1,292,639
Illinois	700,555	733,032	1,639,974
Indiana	726,447	731,721	1,018,597
Iowa	391,355	402,811	993,318
Kansas	273,155	273,607	834,265
Kentucky	320,994	333,160	977,724
Louisiana	218,537	220,335	271,443
Maine	220,859	222,663	799,925
Maryland	101,031	103,642	333,216
Massachusetts	193,567	182,271	751,807
Michigan	903,190	1,079,322	2,272,544
Minnesota	1,465,269	3,163,715	5,447,799
Mississippi	336,673	344,799	539,628
Missouri	654,142	950,392	2,471,016
Montana	249,032	249,032	775,339
Nebraska	218,801	249,721	528,991
Nevada	74,102	83,964	311,684
New Hampshire	127,467	127,467	473,289
New Jersey	139,589	218,134	782,014
New Mexico	147,338	150,231	550,016
New York	727,821	758,835	2,388,428
North Carolina	309,448	459,406	1,027,586
North Dakota	70,638	71,093	118,435
Ohio	820,583	820,965	1,885,305
Oklahoma	485,053	485,053	1,085,279
Oregon	482,317	731,053	1,718,891
Pennsylvania	585,156	585,156	1,955,818
Rhode Island	18,983	18,983	57,811
South Carolina	292,731	321,939	646,790
South Dakota	155,230	160,477	304,832
Tennessee	650,256	895,832	1,128,930
Texas	882,111	883,407	1,764,546
Utah	209,510	221,541	635,490
Vermont	108,822	109,979	262,909
Virginia	321,896	506,466	897,135
Washington	398,676	401,942	1,797,237
West Virginia	180,465	221,427	607,034
Wisconsin	1,049,447	1,049,447	4,019,513
Wyoming	140,851	156,440	712,265
Totals	19,831,644	23,976,447	\$57,780,259

1/A paid license holder is one individual regardless of the number of licenses purchased. Data certified by state fish and game departments.

the Interior Department as a basis for distributing Federal aid funds for fish and wildlife restoration projects.

Although the number of licensed sport fishermen is large, millions of other people also go fishing without being required to purchase a license. A national survey conducted by the Bureau of the Census in 1961 showed there were more than 25 million sport fishermen in the United States who participated substantially



Sport fishing in Montauk State Park, Mo., at the opening of trout season.

in fishing during 1960. Including the more casual participants, the number of fishermen undoubtedly was greater in 1963. In many states, minors are not required to purchase a fishing license, and only six states require a license to fish in salt water.

Some states require sportsmen to purchase separate licenses, stamps, permits, or tags to fish for different kinds of fish. For example, a special stamp is required in several states to fish for trout.



## Tuna

### U.S. CANNED TUNA INDUSTRY PRESENTS AWARD TO INTERIOR DEPARTMENT FOR MARKETING ASSISTANCE:

The United States tuna canning industry presented an award, in the form of a scroll, to Secretary of the Interior Stewart L. Udall on May 5, 1964, for Interior's successful efforts in support of the tuna industry during the past year. In presenting the award, the President of the Tuna Research Foundation commended the Department of the Interior and its Bureau of Commercial Fisheries for "good will and practical support" in boosting tuna sales during 1963. He said the Department's support of the industry was "an inspiring demonstration of the partnership of Government and business" which added strength to the free enterprise system.

Secretary Udall said the Department of the Interior was very pleased to have worked


with the tuna canning industry. He praised the industry for having a "very fine product and very high standards" and said, "We are happy to have had a part in this program. We feel it is the type of relationship with industry that is most productive for our national economy."



Fig. 1 - From left to right, Under Secretary of the Interior James K. Carr, Bureau of Commercial Fisheries Director Donald L. McKernan, and Secretary of the Interior Stewart L. Udall accept United States tuna canning industry award from Jack Gorby, President of the Tuna Research Foundation, Terminal Island, Calif.

In 1963, the Bureau of Commercial Fisheries conducted a nationwide promotional campaign for canned tuna which included the distribution of recipe leaflets, marketing bulletins, television slides, and news releases about the nutritional value of tuna. The Department of Agriculture also played an active role in the promotion by featuring canned tuna in its monthly List of Foods in Plentiful Supply.

# Easy Does It...with TUNA

**SUMMERTIME IS TUNA TIME**

Wonderful tuna - flavorful convenience in a can - truly the chef's best friend. Always available, priced right and prepared so easily in so many sparkling ways. Versatile tuna goes with so many things - it flatters fruit - teams with greens - and codifies casseroles. Tuna sings in sandwiches, too! Terrific tuna, easy and elegant, bright and light, at your fingertips everywhere.

**SPARKLING SALADS**

**Sampling Tossed Salad:** ...  
Sauté tomatoes in a bowl of salad oil by adding chunks of delicious tuna.  
Toss lettuce, onion, and tomatoes with tuna. Drain and toss with your favorite green salad.

**Fast Food:** ...  
One added ingredient to a crisp cabbage slaw with chunks of tomato tuna.  
Dressing and garnish with tomato wedges.

**Fast Menu:** ...  
One added ingredient to a crisp cabbage slaw with chunks of tomato tuna.  
Dressing and garnish with tomato wedges.

**Meatless Salad:** ...  
For a delicious, meaty appetizer, adding chunks of tuna to your meatless salad.

**Garnished Fruit Salad:** ...  
Add a can of tuna to your fruit salad and garnish with the addition of chunks of tuna and green salad.

**Summer Sapporito:** ...  
Tomatoes stuffed with tuna salad are heavenly new idea salad for hot weather appetizers.

**Savory Apple:** ...  
About a half dozen apples by adding a can of tuna to your green salad, garnish with green salad and tomato wedges.

**Summer Sapporito:** ...  
Add a can of tuna to your green salad and garnish with green salad and tomato wedges.

Fig. 2 - Portion of Special Fisheries Marketing Bulletin issued by the U. S. Bureau of Commercial Fisheries and the U. S. Department of Agriculture to promote tuna sales.

In addition to marketing assistance, the Bureau of Commercial Fisheries also assists the fishing industry through biological research, participation in international fishery commissions, loans and grants for vessel construction, and through fishing gear research and exploratory fishing.

Note: See Commercial Fisheries Review, August 1963 p. 54.



## United States Fisheries

### FISH STICKS AND PORTIONS PRODUCTION, 1963:

The United States production of fish sticks and portions during 1963 amounted to 173.9 million pounds valued at \$65.6 million—a gain of 15 percent in quantity and 13 percent in value as compared with 1962. Fish sticks totaled 79.3 million pounds in 1963—7.1 million pounds or 10 percent above 1962, and fish portions amounted to 94.6 million pounds—up 16.0 million pounds or 20 percent.

Table 1 - U.S. Production of Fish Sticks by Months and Type, 1963 1/

Month	Cooked	Uncooked	Total
	..... (1,000 Lbs.) .....		
January .....	7,213	341	7,554
February .....	7,782	459	8,241
March .....	7,688	365	8,053
April .....	6,249	297	6,546
May .....	5,369	381	5,750
June .....	5,828	297	6,125
July .....	4,489	381	4,870
August .....	5,427	269	5,696
September .....	5,336	529	5,865
October .....	7,200	928	8,128
November .....	6,026	445	6,471
December .....	5,525	471	5,996
Total quantity 1963 1/ .....	74,132	5,163	79,295
Total quantity 1962 .....	66,801	5,416	72,217
	..... (\$1,000) .....		
Total value 1963 1/ .....	29,732	1,855	31,587
Total value 1962 .....	26,029	2,047	30,076

1/Preliminary.

Table 2 - U.S. Production of Fish Sticks by Months, 1960-63

Month	1963	1962	1961	1960
	..... (1,000 Lbs.) .....			
January .....	7,554	6,082	6,091	5,511
February .....	8,241	6,886	7,097	6,542
March .....	8,053	7,658	7,233	7,844
April .....	6,546	5,719	5,599	4,871
May .....	5,750	5,643	5,129	3,707
June .....	6,125	5,117	4,928	4,369
July .....	4,870	3,740	3,575	3,691
August .....	5,696	5,760	6,927	5,013
September .....	5,865	6,582	5,206	5,424
October .....	8,128	6,698	6,133	6,560
November .....	6,471	6,305	6,288	6,281
December .....	5,996	6,027	5,618	5,329
Total .....	79,295	72,217	69,824	65,142

1/Preliminary.

Table 3 - U. S. Production of Fish Sticks by Areas, 1963 and 1962

Area	1/1963		1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States .....	24	64,205	26	57,398
Inland & Gulf States .....	7	8,316	6	8,331
Pacific Coast States .....	12	6,774	10	6,488
Total .....	43	79,295	42	72,217

1/Preliminary.

Table 4 - U.S. Production of Fish Portions by Months, 1963 1/

Month	Cooked	Breaded Uncooked	Total	Un-breaded	Total
	..... (1,000 Lbs.) .....				
January .....	1,416	6,563	7,979	194	8,173
February .....	1,317	5,746	7,063	298	7,361
March .....	1,406	7,107	8,513	322	8,835
April .....	1,466	6,271	7,737	182	7,919
May .....	1,769	5,246	7,015	278	7,293
June .....	846	7,749	8,595	179	8,774
July .....	830	3,482	4,312	212	4,524
August .....	1,156	5,264	6,420	264	6,684
September .....	1,846	7,475	9,321	300	9,621
October .....	2,001	7,554	9,555	322	9,877
November .....	1,448	6,398	7,846	290	8,136
December .....	1,122	6,115	7,237	213	7,450
Tot. qty. 1963 1/ .....	16,623	74,970	91,593	3,054	94,647
Tot. qty. 1962 .....	14,007	62,290	76,297	2,381	78,678

Tot. qty. 1963 1/	16,623	74,970	91,593	3,054	94,647
Tot. qty. 1962 ..	14,007	62,290	76,297	2,381	78,678
Tot. value 1963 1/	6,846	26,100	32,946	1,035	33,981
Tot. value 1962 ..	5,999	21,257	27,256	833	28,089
1/Preliminary.					

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, 1963 and 1962

Area	1/1963		1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States .....	27	53,211	26	44,072
Inland & Gulf States .....	10	38,223	12	32,081
Pacific Coast States .....	11	3,213	8	2,525
Total .....	48	94,647	46	78,678

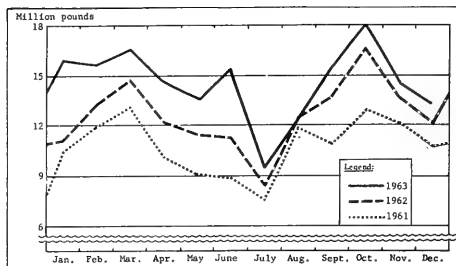
1/Preliminary.

Table 6 - U. S. Production of Fish Portions by Months, 1960-1963

Month	1/1963	1962	1961	1960
	..... (1,000 Lbs.) .....			
January .....	8,173	5,077	4,303	3,632
February .....	7,361	6,360	4,902	3,502
March .....	8,835	7,036	5,831	4,706
April .....	7,919	6,408	4,484	3,492
May .....	7,293	5,818	3,879	3,253
June .....	8,774	6,137	4,039	3,995
July .....	4,524	4,679	3,962	4,088
August .....	6,684	6,687	4,963	3,558
September .....	9,621	7,180	5,745	4,631
October .....	9,877	9,871	6,759	5,275
November .....	8,136	7,406	5,789	4,700
December .....	7,450	6,019	5,191	4,458
Total .....	94,647	78,678	59,847	49,381

1/Preliminary.

Cooked fish sticks (74.1 million pounds) made up 93 percent of the 1963 fish stick total, while the remaining 5.2



U. S. production of fish sticks and portions, 1961-63.

million pounds or 7 percent consisted of raw fish sticks. A total of 91.6 million pounds of breaded fish portions (of which 75.0 million pounds were raw) and 3.0 million pounds of unbreaded portions were processed during 1963.

The Atlantic Coast was the principal area in the production of both fish sticks and fish portions with 64.2 and 53.2 million pounds, respectively. The inland and Gulf States were next with 8.3 million pounds of fish sticks and 38.2 million pounds of fish portions. The Pacific Coast States made up the remaining 10.0 million pounds of fish sticks and fish portions.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 2, 1964, amounted to 11,744,881 pounds (about 559,300 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

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### PROCESSED EDIBLE FISHERY PRODUCTS, MARCH 1964:

United States imports of processed edible fishery products in March 1964 were up 26.7 percent in quantity and 25.3 percent in value from those in the previous month. There was a seasonal increase in imports of groundfish fillets and blocks and slabs. Imports were also up for canned tuna in brine, canned sardines not in oil, and canned oysters.

Compared with the same month in 1963, imports in March 1964 were down 8.5 percent in quantity and 3.7 percent in value. Imports of canned sardines not in oil were much lower this March. Imports were also down for most other canned fishery products, except canned oysters. The decline was

partly offset by much heavier arrivals of groundfish fillets and blocks and slabs.

In the first 3 months of 1964, imports were up 2.6 percent in quantity and 7.3 percent in value from those in the same period of 1963. During January-March 1964 there were larger imports of groundfish fillets, flounder fillets, blocks and slabs, sea catfish fillets, yellow pike fillets, and canned sardines in oil, but imports were down for swordfish fillets, canned sardines not in oil, canned tuna in brine, and canned crab meat.

U. S. Imports and Exports of Processed Edible Fishery Products, March 1964 with Comparisons

Item	Quantity			Value		
	Mar. 1964	Jan.-Mar. 1964	1963	Mar. 1964	Jan.-Mar. 1964	1963
.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of \$) ..	.. (Millions of \$) ..	.. (Millions of \$) ..
Fish & Shellfish:	43.1	128.0	124.7	12.9	37.2	34.7
Imports <sup>1</sup>	47.1	124.7	129.0	13.4	37.2	34.7
Exports <sup>2</sup>	2.5	11.9	11.0	1.0	1.2	4.7

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in March 1964 were down 50 percent in quantity and 54.5 percent in value from those in the previous month. In March, there was a decline in shipments of all leading canned fish export items, except canned sardines in oil.

Compared with the same month of the previous year, the exports in March 1964 were down 19.3 percent in quantity and 16.7 percent in value. A sharp drop in exports of canned salmon, canned sardines not in oil, and canned squid, was partly offset by larger shipments of canned sardines in oil, canned shrimp, and canned mackerel.

Processed fish and shellfish exports in the first 3 months of 1964 were up 8.2 percent in quantity and 14.6 percent in value from those in the same period of 1963. In January-March 1964 there were much larger shipments of canned mackerel and shipments of canned sardines in oil and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.



## Washington

### SALMON PLANTING PROGRAM CONTINUES:

The Washington State Department of Fisheries has not stopped planting young salmon in streams that run through or border Indian reservations. Both the Indians and others will share in the future salmon harvest.

During April 1964, more than 3.5 million young chinook salmon were planted in the Nisqually, Puyallup, and Skokomish Rivers, and 315,000 fall chinook fingerlings were to be

planted in the Nisqually in May 1964, along with a plant of 100,000 in the Puyallup. The 3 rivers will then have received the following chinook salmon plants in 1964: Nisqually - 931,831; main Skokomish and Purdy Creek tributary - 2,809,750; and Puyallup - 362,784 fish.

The Puyallup plants are small because last year very few salmon reached the Puyallup salmon hatchery due to unrestricted off-reservation Indian fishing on the spawning run of chinook salmon. (Washington State Department of Fisheries, May 1, 1964.)

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#### DOGFISH SHARK FOR HATCHERY FISH FEED:

A firm in Tacoma, Wash., plans to use the unpopular dogfish shark to make moist pellet food to feed desirable fish such as trout and salmon, the Director of the Washington State Fisheries Department announced May 1, 1964. The Tacoma firm has plans to process around 200 tons of dogfish each month into hatchery feed.

The moist pellet food was perfected by the Oregon Fish Commission and used successfully by the Washington State Department of Fisheries in rearing silver salmon. Tuna viscera has been the chief ingredient of the pellet, but experiments have been made using dogfish as the chief ingredient. Fish culturists say the dogfish pellet food can meet the high quality standards set by fisheries agencies for food used in rearing trout and salmon.

Permits have been granted two trawlers to fish for dogfish in Puget Sound south of Point Defiance. Both commercial and sports fishermen, it is believed, will support any efforts to thin out the dogfish population of Puget Sound. The Tacoma company will reduce some dogfish, over that needed for pellet food, for use as fertilizer. (Washington State Department of Fisheries, May 1, 1964.)



#### **Wholesale Prices**

##### EDIBLE FISH AND SHELLFISH, MAY 1964:

Wholesale prices for edible fishery products (fresh, frozen, and canned) in May 1964 moved upward for a number of the fresh and frozen items--principally halibut, salmon, and

shrimp. But the higher prices were offset to some extent by lower prices for several of the other fresh, frozen, and canned fishery products. The overall wholesale price index this May at 105.4 percent of the 1957-59 average was up 2.2 percent from April, but was down 9.1 percent from the same month a year earlier.

Higher prices prevailed this May for the first-of-the-season supplies of western fresh halibut (up 22.6 percent) and salmon (up 9.9 percent) at New York City, and also for Great Lakes fresh-water fish. Those were largely responsible for the 9.2-percent increase from April to May in the subgroup index for drawn, dressed, or whole finfish. In contrast, May prices were lower for ex-vessel large haddock (down 10.2 percent) at Boston, and those were lower than in May 1963 by 29.8 percent. Compared with May 1963, prices in the subgroup this May were lower for all items except salmon (up 0.2 percent), and the subgroup index was down 6.8 percent.

Higher prices from April to May for South Atlantic fresh shrimp (up 4.2 percent) at New York City were the direct cause of the 1.9-percent increase in the subgroup index for processed fresh fish and shellfish. Wholesale prices for fresh haddock fillets at Boston this May were down 4.9 percent from the previous month, and compared with May a year earlier they were lower by 25.3 percent. Compared with May 1963, the subgroup index this May was down 12.5 percent because prices for all items in the subgroup were down considerably.



Buyer examining fresh West Coast halibut at Fulton Fish Market, New York City.

The May 1964 subgroup index for processed frozen fish and shellfish at 94.7 percent of the 1957-59 average was unchanged from the previous month. From April to May, prices for frozen fillets in the subgroup were lower, but frozen shrimp prices at Chicago were higher (up 2.0 percent) and tended to cancel out any apparent drop in the May subgroup wholesale price index. As compared with May 1963, the subgroup index this May was down 16.9 percent--prices were sharply lower for shrimp, and substantially lower for fillets of ocean perch and flounder.

May 1964 prices for canned tuna (down 1.2 percent) were somewhat lower than in April, as were prices for canned Maine sardines (down 2.4 percent). As a result, the subgroup index was down 0.3 percent despite higher canned salmon prices (up 1.1 percent). Higher prices for canned pink salmon were the result of improved demand and partial clearance of stocks. The subgroup index this May was lower than the same month a year earlier by 2.6 percent. Prices for canned salmon and canned Maine sardines were lower than in May 1963, but canned tuna prices (up 2.2 percent) were higher.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1964 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			May 1964	Apr. 1964	May 1964	Apr. 1964	Mar. 1964	May 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					105.4	103.1	104.1	115.9
<u>Fresh &amp; Frozen Fishery Products:</u> . . . . .					107.4	103.7	105.5	122.4
<u>Drawn, Dressed, or Whole Finfish:</u> . . . . .					107.5	98.4	100.9	115.4
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.08	.09	60.5	67.4	61.8	86.2
Halibut, West., 20/80 lbs., drsd., fresh or froz. . . . .	New York	lb.	.34	.28	101.5	82.8	89.2	105.9
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.92	.83	127.8	116.3	114.2	127.5
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.62	.57	92.5	84.3	108.2	110.4
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.58	.43	94.2	69.6	114.7	108.1
<u>Processed, Fresh (Fish &amp; Shellfish):</u> . . . . .					117.2	115.0	116.1	133.9
Fillets, haddock, sm., skins on, 20-lb. tins . . . . .	Boston	lb.	.30	.31	71.6	75.3	77.7	95.9
Shrimp, lge. (26-30 count), headless, fresh. . . . .	New York	lb.	.99	.95	116.0	111.3	113.1	134.8
Oysters, smoked, standards . . . . .	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	139.1
<u>Processed, Frozen (Fish &amp; Shellfish):</u> . . . . .					94.7	94.7	96.2	114.0
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.37	.37	92.5	93.8	98.9	98.9
Haddock, sm., skins on, 1-lb. pkg. . . . .	Boston	lb.	.36	.37	104.1	107.0	108.5	102.6
Ocean perch, lge., skins on 1-lb. pkg. . . . .	Boston	lb.	.30	.31	105.2	108.7	114.0	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg. . . . .	Chicago	lb.	.75	.73	88.3	86.6	87.2	120.4
<u>Canned Fishery Products:</u> . . . . .					102.2	102.5	102.2	104.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	22.25	22.00	97.0	95.9	94.8	105.7
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.50	11.63	102.1	103.3	103.3	99.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	6.13	6.13	103.9	103.9	103.9	2100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.86	9.09	113.7	116.5	118.2	116.2
1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								
2/ Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.								

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## RADIATION AND FOOD

Consumers are hearing more and more about foods treated with some form of "radiation" to preserve them, or to kill insects or insect eggs, or to prevent sprouting, or to accomplish some other purpose.

They have begun to ask the U. S. Food and Drug Administration (FDA) questions about such "irradiated" foods.

What are the advantages of irradiating foods? Proponents of the process claim that for some foods irradiation substantially extends the life of a product without refrigeration—an advantage more important at the present time for the armed services than for the general consumer public. But sponsors of the process view it as a development with important implications for the consumer.

The advantage of irradiation of wheat, of course, is that the radiation kills the insect life that would otherwise develop and destroy the wheat or render it unusable for food. ("FDA Memo for Consumers," U. S. Food and Drug Administration, February 19, 1964.)

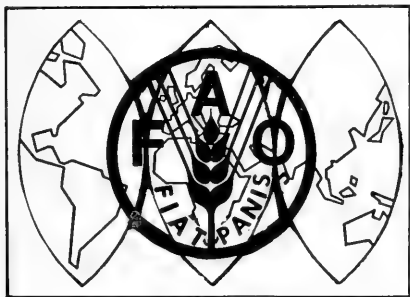


## International

FOOD AND AGRICULTURE ORGANIZATION

### INDO-PACIFIC FISHERIES DEVELOPMENT SEMINAR:

In the Indo-Pacific region, fisheries are of great importance, especially from the standpoint of nutrition, and governments in the region attach special importance to increasing fish production and consumption. That dominant fact emerged from the 17-day seminar on fisheries development, planning, and administration held in Canberra, Australia, in February 1964.



Organized by the Food and Agriculture Organization (FAO) Indo-Pacific Fisheries Council, the seminar was attended by fisheries administrators from Australia, Ceylon, India, Japan, French Polynesia, Korea, Malaysia, Pakistan, Papua-New Guinea, the Philippines, Thailand, Hong Kong, American Samoa, Guam, New Zealand, Viet-nam, and the South Pacific Commission.

The three FAO fisheries experts attending were the Acting Chief, Economics Branch, Fisheries Division, FAO, Rome; the Chief Economist, Marine Resources Institute, FAO, Peru; and the Regional Officer for Asia and the Far East, FAO, Bangkok.

The seminar was officially opened by the Australian Minister for Primary Industry,

who outlined Australia's role in the world food program and referred to some of the problems being experienced by countries in the Indo-Pacific region.

An FAO representative, outlining the background and purpose of the seminar, said that the formulation of realistic fishery development programs had always been a difficult and complex matter due to uncertainties about natural resources and potential markets, and the heavy dependence of fisheries on developments in other sectors of the economy. Moreover, the nature of the fishing industry tended to isolate it from other economic activities, geographically, socially, and administratively, thus increasing the difficulty of coordinated planning and of providing the government services required for its development.

"More than ever before there is an outstanding need to clarify the objectives of fishery development and the importance of these in relation to each other; to examine the real opportunities for development represented by the natural resources and potential markets; to recognize the limits of the available resources of personnel, facilities, equipment and funds; and to review current and planned programs in the light of these fundamental considerations.

"At the present time, many governments in the region are giving special consideration to the need for improving their planning organization and administration in agriculture. In view of the importance of coordinating fishery programs with broader programs of agricultural development and industrialization, it would be desirable to give early consideration to the special problems of fisheries, so that fishery programs might also benefit from such measures," the FAO representative concluded.

Subjects discussed by the seminar included (1) survey and appraisal of fishing situations--the nature of fishery resources--supply, technological, and economic aspects; (2) objectives of government fishery policies; (3) role of government in fishery development--organi-

## International (Contd.):

zation of government services to fisheries industry, organization and management of resources research, organization and conduct of technological research, organization and conduct of economic research; and (4) other government fishery activities in the field of statistics, fish marketing, fishery cooperatives, fishery credit, and fisheries education and training. (Australian Fisheries News-letter, March 1964.)

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#### OUTBOARD MOTORS INCREASE FISHING EFFICIENCY OF TRADITIONAL CRAFT IN SIX COUNTRIES:

Experience gained in mechanizing traditional fishing craft in Ceylon is now helping other countries add outboard motors to small fishing vessels under a Food and Agriculture Organization (FAO) Freedom From Hunger Project.

Three years ago a 45-year old Ceylonese fisherman lived on the shores of the Bay of Bengal in a small house with walls of thatched palm and a roof of palm fronds. He and his wife and seven children were crowded in the small house, but it was all he could afford. Now he has moved into a modern bungalow with brick walls and a tile roof. His income is ten times higher than it was three years ago, his children are being educated, and he is branching out into other enterprises connected with fishing.

That story has been repeated many times--with individual variations--in Ceylon since 1951, under a government program to help fishermen change from their traditional crafts propelled by sail or oar to mechanized methods of fishing. For hundreds of years fishing boats in Ceylon have been either dugout canoes or log rafts called catamarans. They are laborious and limited in scope. They have to be paddled if there is no wind. Sometimes a squall comes up when a traditional fisherman is far offshore and, if he loses sight of land before lights come on at night in the villages, he may lose his life. Sometimes the wind fails and he has to paddle back to shore, arriving during the heat of the day with his catch spoiled. Even with the most strenuous effort, a fisherman in a sail-powered catamaran could never in a single night get out to the 6- or 8-fathom depths where the big fish are.

The solution to those problems has been an outboard motor. A Finnish naval architect sent to Ceylon in 1959 by FAO helped the Ceylonese Government set up a mechanization program for traditional fishing craft. Discussing their initial work, the Finnish expert said, "We were sure that outboard engines could be fitted to catamarans and work efficiently, although there had been difficulties with them previously. We had a few strokes of luck at the beginning--mainly in the form of people. One of those people was 'Nag'--as we came to call him. Another was a Ceylonese fisheries extension officer. . . . He caught on very quickly to the use of the outboards and helped greatly. We got two outboards from a Swedish firm and started testing them, fitted to Nag's big catamaran, on Nainativu Island, off the north coast. Normally the catamaran carries six nets. We borrowed 11 more from Nag's neighbors. With these and the motorized raft, with which he was able to go out to the deep waters, Nag's catch increased 10 times--to 130 lbs. per day compared with 13. . . ."

Now 860 of Ceylon's traditional craft have been fitted with outboard motors, provided mainly through private business channels. In addition, about 1,200 inboard powered boats have been built.

The 360 rafts mechanized in 1962 are said to be responsible for an increase of 2,000 metric tons in Ceylon's catch for that year. (The total increase in the Ceylonese fisheries catch between 1961 and 1962 was about 10,000 tons, due to all improvements in fishing techniques and boats.) The country's total catch showed a steady increase from 39,000 tons in 1957 to 84,000 tons in 1962, according to Ceylonese fishery statistics.

The Ceylon project is similar to others now being carried out in 5 other countries, involving more than 500 engines, under FAO's Freedom from Hunger Campaign. The program began with an offer by a manufacturer of outboard motors to give FAO a large number of engines for use in worthwhile projects to demonstrate their value in fishing boats. So far the company has agreed to supply several hundred engines. Other private companies have also offered engines at very low prices, and money to help buy and install them is being supplied by a variety of donors.

The engines are being given to fishermen's cooperative associations. They are sold on easy terms to selected fishermen-members



## International (Contd.):

of the cooperatives, and proceeds form revolving funds, which in turn will be used for ventures which will help the fishing communities.

An FAO representative said, "It is necessary to put each project on a commercial basis, so that the fisherman has a stake in it and therefore a strong incentive for repayment . . . we feel that if the fisherman is repaying to his own association it will encourage him because it is, in effect, his money."

Besides supplying and installing engines, the project will also provide repair kits and spare parts. An expert will study the type of motor and installation best suited to local boats and, if necessary, another expert will organize maintenance and training of mechanic assistants.

So far the following engines have been provided: 28 in Togo (for a 2-year project launched in November 1963); 10 in Zanzibar; 50 in Dahomey; 85 in the United Arab Republic; and 360 in East Pakistan.

The Finnish naval architect who pioneered the Ceylonese project has now surveyed 22 countries, and new projects are envisioned in a total of 13 countries, using 3,500 outboard motors. For India, for example, where there are an estimated 80,000 unmechanized fishing craft, a project involving 2,000 engines for a 3-year period is being planned. It was expected that the plan of operation for the Indian project would be signed in the spring of 1964, pending agreement on all details.

"There are two interesting aspects of the Freedom From Hunger Campaign (FFHC) outboard projects," the Finnish naval architect said. "First, results can be seen very quickly, and, second, because the mechanized rafts can be easily beached, the fishermen can continue to live in their homes and fish offshore from the beach as they have always done, but taking much bigger catches. There is no need for them to move to some far-off fishing harbour, which is the situation in many countries when mechanized fishing boats are introduced." (Food and Agriculture Organization of the United Nations, Rome, April 10, 1964.)

Note: See Commercial Fisheries Review, October 1962 p. 48.

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## SWEDEN HELPS PAKISTAN MECHANIZE SMALL FISHING CRAFT:

Sweden's Agency for International Assistance has pledged US\$158,600 to equip 285 small fishing craft in East Pakistan with outboard motors during the next two years. The project, which is being carried out under the Food and Agriculture Organization's (FAO) Freedom From Hunger Campaign (FFHC), will be reviewed at the end of the second year and if everything has gone well Sweden will provide East Pakistani fishermen with an additional 315 outboard motors. This would raise Sweden's total contribution to \$291,000, some \$70,000 of it cash and the rest in 600 motors and spare parts valued at about \$370 each. The Pakistani Government counterpart contribution is \$201,123.

The project is now under way and is scheduled to run three years. Its aim is to improve earnings and standard of living of some 3,000 fishing families in 3 villages near Chittagong, and 2 in the Sundarban area. The outboard motors will be sold to the fishermen on easy terms through local fishing cooperatives. Repair kits will also be provided and a Swedish expert will instruct the fishermen in engine care.

Tests carried out by FAO in Ceylon and other countries show that, when coupled with modern gear, equipping local craft outboard engines increases fishermen's catches an average of 300 percent.

FAO has five outboard mechanization projects in operation under the Freedom From Hunger Campaign (FFHC)--in Dahomey, Togo, East Pakistan, the United Arab Republic, and Zanzibar. They involve a total of 773 engines. Nine similar programs involving above 2,000 more engines are planned for India, Chile, Dominican Republic, Haiti, Tanganyika, Brazil, Nyasaland, Northern Rhodesia, and Burundi.

Sweden has already contributed \$376,383 to FFHC. Swedish funds have helped to pay FFHC central campaign costs and are now being used to finance projects in Asia and Africa. In addition to its East Pakistan pledge, Sweden has also agreed to contribute an additional \$712,000 to finance a training center for women and girls in Tanganyika. The four-year Tanganyika project was launched earlier this year with an initial Swedish contribution of \$173,000.

## International (Contd.):

Counting Sweden's contributions already paid and funds pledged for the future, the total Swedish commitment to the four-year old Freedom From Hunger Campaign now stands at \$1,379,383. (Food and Agriculture Organization, Rome, March 31, 1964.)

INTERNATIONAL CONVENTION FOR  
THE NORTHWEST ATLANTIC FISHERIESSOVIET UNION RATIFIES PROTOCOL  
AMENDMENT CONCERNING  
HARP AND HOOD SEALS:

On April 13, 1964, the Union of Soviet Socialist Republics deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries. The Protocol (done at Washington, D.C., July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not in force. (Bulletin, U. S. Department of State, May 4, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

## INTERNATIONAL PACIFIC HALIBUT COMMISSION

## SPECIAL MEETING HELD:

The International Pacific Halibut Commission, which is responsible for the regulation of the halibut fishery of the Northern Pacific Ocean and Bering Sea on behalf of Canada and the United States, held a special meeting in Seattle, Wash., on June 4, 1964.

The purpose of the meeting was to examine recent developments in the Pacific halibut fishery, and particularly those in the Eastern Bering Sea where there has been a serious decline in the fishery.

At the meeting the Commission reviewed the situation with its investigational staff and conferred with invited representatives of the vessel owners, fishermen, and dealers from ports in Washington, British Columbia, and Alaska.

## NORTH PACIFIC FUR SEAL CONVENTION

JAPAN RATIFIES PROTOCOL AMENDING  
INTERIM CONVENTION ON  
CONSERVATION OF FUR SEALS:

On April 10, 1964, Japan deposited ratification of a Protocol amending the Interim Convention on Conservation of the North Pacific Fur Seals. The Protocol (done at Wash-

ington, D.C., October 8, 1963) relates to the continuation of the Interim Convention for another six-year period and reflects the recommendations adopted by the North Pacific Fur Seal Commission on November 30, 1962. The Protocol entered into force on April 10, 1964. (Bulletin, U.S. Department of State, April 27, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 48; December 1963 p. 52.

## NORTHWEST PACIFIC FISHERIES COMMISSION

SALMON AND CRAB FISHERIES  
NEGOTIATIONS CONCLUDED BETWEEN  
U.S.S.R. AND JAPAN:

The eighth annual meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) closed on April 28, 1964, after 58 days of negotiations. The two nations signed notes of agreement covering fisheries regulations and crab and salmon catch quotas in the treaty area. The 1964 salmon catch quotas under the agreement were set at 110,000 metric tons for Japan (55,000 tons each for Areas A and B), and 65,000 metric tons for the Soviet Union; and 1964 king crab production quotas of 252,000 cases ( $\frac{1}{2}$ -lb. 48's) for Japan and 378,000 cases for the Soviet Union were established.

The Commission readopted the following regulations for the salmon fishery in convention waters:

Convention Areas:

(a) Area A, including the Sea of Okhotsk and the Bering Sea, is described as waters bounded on the east and south by a line commencing at Cape Navarin; thence southeast to a point of intersection at 55° N. latitude, 175° W. longitude; thence south to 45° N. latitude; thence west to 155° E. longitude; thence southwest to Aku-Yuri Island, and the Sea of Japan north of 45° N. latitude.

(b) Area B is described as all convention waters south of the southern boundary of Area A.

Prohibited Fishing Areas:

(a) Sea of Japan and Sea of Okhotsk north of 45° N. latitude.

(b) All waters north of 45°51' N. latitude bounded on the east and south by a line commencing at a point 20 miles southeast of Cape Olyutorskoe; thence to a point 20 miles southeast of Cape Goven; thence to a point 20 miles east of Cape Ozernoi; thence 20 miles east of Cape Africa; thence east at 56° N. latitude to a point at 170° E. longitude; thence south to 53°50' N. latitude; thence west to a point 20 miles southeast of Cape Shipunskii; thence southwest to 160° E. longitude; thence south to a point of intersection at 45°51' N. latitude; thence west to a point of intersection at 151°30' E. longitude.

(c) Area north of the southern boundary line of Area A and west of 151°30' E. longitude.

Fishing Seasons:

(a) Area A:

(1) Mothership fishery--May 15-August 10.

(2) Land-locked fishery--June 21-August 10.

(b) Area B:

Drift net and long-line fishery--April 30-June 30.

## International (Contd.):

Catch Limit on Catcher Boat and Survey Vessel:

- (a) Catch limit on catcher boats not to exceed 300 metric tons.
- (b) Catch limit on survey vessels not to exceed 150 metric tons.

Total catch of catcher boats and survey vessels attached to one mothership shall not exceed total catch allocated to mothership. Should the catch of catcher boats and survey vessels fall within the amount allocated to each mothership, an increase in catch per catcher boat and survey vessel is permitted.

Gear Regulations:

- (a) Length of nets per boat:
  - (1) 10 kilometers (6.2 miles)--Sea of Okhotsk.
  - (2) 12 kilometers (7.5 miles)--In that portion of Area A within a line drawn from Cape Olyutorskoe at 170°25' E, longitude running south to 48° N, latitude, thence south-west to Aku-Yuri Island (Bulgarian Line).
  - (3) 15 kilometers (9.3 miles)--all other areas.
- (b) Distance between nets set for fishing:
  - (1) Not less than 12 kilometers (7.5 miles)--Sea of Okhotsk.
  - (2) Not less than 10 kilometers (6.2 miles)--Pacific area within Bulgarian Line.
  - (3) Not less than 8 kilometers (5.0 miles)--other areas.
  - (4) No distance limitation between nets operated by small boats fishing south of 48° N, latitude.
- (c) Size of mesh of gill nets:
  - (1) Gill nets operated by each catcher boat of mothership fleet in 1963 shall have a mesh size larger than 60 millimeters (2.36 inches) measured knot to knot; however, not less than 60 percent of gill nets fished by each boat shall have a mesh size larger than 65 millimeters (2.56 inches).
  - (2) Gill nets operated by land-based fleet in Area B shall have a mesh size not less than 55 millimeters (2.17 inches).
- (d) Long-line regulations:
  - (1) Diameter of branch lines used in long-line fishery in Area B (excluding Sea of Japan) shall be not less than 0.522 millimeters.
  - (2) Long-line fishing prohibited in Area A.

Japanese Government sources disclosed that Japan agreed to accept the Soviet proposal to delete from the Annex of the Japan-U.S.S.R. Fisheries Treaty the 10-percent catch allowance provided for Area B (south of 45° N, latitude), which allowed Japan to take up to 10 percent over the catch quota set for that area. Japan's acceptance of this proposal, however, was based on the condition that the Commission would insert in the agreement Japan's statement of view with respect to the 10-percent allowance, and

that the Commission would recognize this allowance for the 1964 fishing season.

The allowance was originally provided for Area B because of the difficulty of allocating separate catch quotas to the numerous small Japanese salmon vessels fishing in that area. Its elimination means that Japan can be accused of violating the Treaty even if her catches slightly exceed the area quota. Therefore, this concession is expected to place Japan in a disadvantageous position in future negotiations. In previous years, Japan had not been able to effectively regulate fishing in Area B. For example, in 1963 Japan had intended to limit the catch of the land-based long-line fleet to about 15,000 tons, but final landings figures showed that the total catch for the long-line fleet exceeded 20,000 tons.

The Japanese Government is now reported to be studying the method of allocating catch quotas to the domestic fisheries. The 1963 quota for Area A (57,000 tons) was divided on the basis of 81.21 percent for the mothership-type salmon fishery and 18.79 percent for the land-based gill-net fishery. However, inasmuch as the quota for Area B, which is fished exclusively by the land-based fleet, has been reduced by 8,000 tons this year and the 1964 quota for Area A has been reduced by only 2,000 tons as compared to 1963, the land-based fishery operators are expected to agitate for a bigger proportion of the Area A quota allotment. The 1962 catch quota for Area A was 55,000 tons, and for Area B 60,000 tons.

In Area B, the Japanese Fisheries Agency plans to allocate quotas by type of fishery (i.e., gill-net, long-line, etc.) and also plans to strengthen domestic regulatory measures to ensure full compliance with the Commission's regulations. In addition, the Agency hopes to develop a rapid reporting statistical system and a system of estimating catches of vessels at sea, so that when the quotas allotted to the different fisheries are about to be met, the Agency will be able to direct those vessels at sea to terminate their operations even before the season ends.

Concerning the 1964 negotiations, the Japanese Minister of Agriculture and Forestry stated that the quota agreement was a reasonable settlement considering the fact that 1964 is a poor pink salmon year. The president of a leading Japanese fishing company viewed the Soviet Union's modification of its original insistence upon a 48,000-ton quota for Area B as an unexpected concession. The president of the National Federation of Salmon Gill-Net Fishermen's Associations, however, expressed deep disappointment over the 55,000-ton quota for Area B, stating that the allocation of the quota, which should be determined on the basis of scientific analysis of resources, was instead established as a result of force meeting force, with Japan again being forced to retreat. (Suisan Keizai Shimbun, April 23, 25, & 29; Nihon Keizai Shimbun, April 24, 1964; and United States Embassy, Tokyo, May 4, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 58; July 1962 p. 47.

## ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERY TECHNOLOGISTS MEETING:

The Organization for Economic Co-operation and Development (OECD) is organizing a meeting of fishery technologists at Scheveningen (The Hague) in the Netherlands, September 14-17, 1964.

The object of the meeting is to provide for a broad exchange of views between technologists from OECD Member Countries on the scientific work accomplished and the practical experience gained since their last meeting in 1956. Considerable progress has been made since 1956 in the techniques of handling, processing, and distributing fish and the OECD has felt the need to convene a further meeting of specialists in this field.

OECD expects that 150 participants from research centers and industry will attend the meeting. Technologists who wish to attend the meeting are asked to apply as soon as possible.

## International (Contd.):

sible, either directly to the Fisheries Division of the OECD (2, rue Andre Pascal, Paris 18e, France), or through their country's Delegation to the OECD. Travel and accommodation expenses will be borne by participants.

The provisional program of the meeting lists the following topics:

September 14, 1964--First and Second Sessions:

1. Storage of Fish in Chilled Sea Water at Sea (Biochemical and Engineering Aspects):
  - (a) Introductory paper on storage in chilled sea water.
  - (b) Storing groundfish in refrigerated sea water.
  - (c) Experiments with storage of herring and shrimp in chilled sea water.
  - (d) Microbiological aspects of storage of fish in chilled sea water.
2. Prepackaging of Fresh, Frozen, Smoked and Other Products for Retail Sale:
  - (a) Public health aspects of prepackaging.
  - (b) Properties of packaging materials and their suitability for various products.
  - (c) Technological application.
  - (d) Practical experiences with prepacked fresh fish for retail market.

September 15--Third and Fourth Sessions:

3. Handling of Wet Fish Aboard and on Shore (Except in Chilled Sea Water):
  - (a) General introduction.
  - (b) Mechanization of German trawlers.
  - (c) Development in United States.
  - (d) Construction of trawlers in connection with handling of the catch.
  - (e) Experience in Norway.
4. Handling of Wet Fish Aboard and on Shore:
  - (a) Handling of fish in the auction hall and layout of the auction hall.
  - (b) Experiences with plastic fish boxes in French harbors.
  - (c) Hygienic aspects of fish boxes.
  - (d) Handling and distribution of fresh fish.
  - (e) Inland distribution of fresh fish.

September 16--Visits to be organized by the Dutch authorities, details of which will be sent with the definite agenda.

September 17--Fifth and Sixth Sessions:

5. Problems in Freezing, Cold Storage and Thawing:
  - (a) General introduction about technical and economical aspects of freezing of fish at sea.
  - (b) German experiences in freezing fish at sea.
  - (c) Special problems with freezing of very fresh fish.
6. Problems in Freezing, Cold Storage and Thawing:
  - (a) Time/temperature tolerance for frozen fish and fish products.
  - (b) Thawing of frozen fish, mainly for further processing.
  - (c) Thawing of frozen fish.

Each of the six sessions will be followed by a discussion period on the subject presented. (OECD Technical Information Bulletin, Paris, May 13, 1964.)

UNESCO INTERGOVERNMENTAL  
OCEANOGRAPHIC COMMISSIONTHIRD SESSION MEETS IN PARIS,  
JUNE 10-19, 1964:

Interested countries have been invited to attend the Third Session of the Intergovernmental Oceanographic Commission (IOC) meeting in Paris, June 10-19, 1964. UNESCO, at its 11th session, adopted a resolution establishing the IOC "to promote scientific investigation with a view to learning more about the nature and resources of the oceans, through the concerted action of its members." IOC programs are carried out through cooperative action by Member States rather than by centralized action, and each Member determines if and to what degree he will participate in any program.

IOC has assumed the coordination of the International Indian Ocean Expedition (IIOE), which was originally launched by the Scientific Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions (ICSU). That program will continue through 1965. The first major program initiated by IOC was the International Cooperative Investigation of the Tropical Atlantic (ICITA), which is virtually completed. IOC has also sponsored a South Atlantic Cooperative Investigation (SACI), and is expected to approve a Cooperative Study of the Kuroshio (CSK) at the Third Session.

Other programs to be considered at the Third Session include the General Bathymetric Chart of the Oceans sponsored by the International Hydrographic Bureau (IHB), the International Biological Program (IBP) sponsored by ICSU, installation and maintenance of tide gauges, a tsunami (tidal wave) warning system in the Pacific, and programs which Members may propose at the Session.

The Third Session will also consider a General Scientific Framework for World Ocean Study (GSF), exchange of data and information, means by which the Commission can assist its Members in development of national oceanographic programs, and a Second International Oceanographic Congress tentatively scheduled for the spring of 1966 in Moscow.



## Argentina

### FISHERIES TRENDS, 1963:

Argentina's fishing industry reported a record production in 1963 and even better results are expected in 1964. Commercial fisheries landings in Argentina in 1963 consisted of 110,320 metric tons of salt-water fish and 11,988 tons of fresh-water fish for a total of 122,308 tons, or 32 percent more than the 92,326 tons landed in 1962.

Argentine fish meal production from salt-water fish in 1963 totaled 6,636 metric tons, which was more than double the 1962 production of 3,248 tons. Fish meal exports for the first 11 months of 1963 amounted to 3,211 metric tons, as compared with 1,584 tons exported in the full year 1962.

Increased production of fishery products in 1963 was aided by the expansion of the freezing and packing industry, especially with respect to the preparation of fillets for export (largely to the United States). The capacity of the fish meal plants at Mar del Plata was also increased and new foreign markets, mainly in Europe, have been found for the increasing fish meal production. Argentina's fish meal exports in the first 11 months of 1963 to West Germany alone totaled 2,267 metric tons, whereas in 1961, total fish meal exports amounted to only 260 tons.

Argentine officials are optimistic that 1964 will bring further development in the fishing industry. They believe that the constant increase in domestic beef prices will spur a significant rise in local consumption of fish. To increase the catch, they plan to add about 20 new fishing vessels to the existing deep-sea fleet of 40 vessels. They also look for expanded fish meal exports. Argentina's fish meal industry is reported to have an annual production capacity of 12,000 tons, so there is considerable unused capacity.

There is, however, a need for further investment in parts of the fishing industry. National and Provincial authorities are planning a development program for the fishing industry which would authorize 147.5 million pesos (about US\$1.1 million) in credits to renew plant and equipment, increase production, and improve the system of distribution and marketing. (United States Embassy, Buenos Aires, April 30, 1964.)

Note: See *Commercial Fisheries Review*, Dec. 1963 p. 54; Nov. 1963 p. 54; and Sept. 1963 p. 57.

## Australia

### LICENSING AND IMPORT REGULATIONS AFFECTING FISHERIES:

The Australian fisheries are subject to regulation by both the Commonwealth Government and by the Australian State Governments.

Licensing: Commonwealth and State or Territorial licenses are required to fish in Australian waters. Licenses are required for each crew member as well as for the vessel. Foreign fishing vessels may be licensed to fish in Australian waters, although no foreign vessels are so licensed at present, according to the Fisheries Division of the Commonwealth Department of Primary Industry.

Licenses are required of all Australian fishing vessels, regardless of where they fish. The Commonwealth has delegated its licensing authority to the States and Territories, and requires the possession of a local fishing license as a condition for the issuance of a Commonwealth license.

Restrictions on Landing Fish in Australia: Laws and regulations prohibit the landing of fish in Australia by foreign-registered fishing vessels without prior approval of the Commonwealth Minister for Primary Industry.

Restrictions on Importing Fishing Equipment: The Fisheries Division and the Department of Customs and Excise of the Commonwealth Government have stated that there are no restrictions, other than payment of applicable customs duties, on the importation of fishing equipment into Australia.

Providing suitably equivalent vessels of Australian manufacture are not "reasonably available," fishing vessels may be imported free of duty under "by-law," or at the British preferential rate (usually 7.5 percent ad valorem). Application for admission under "by-law" must be made to the Department of Customs and Excise.

Fishing vessels denied admission under those provisions may be admitted on payment of the following import duties:

	BPT	MFN
Vessels exceeding 500 tons (gross register)	Free	12.5
Other vessels . . . . .	32.5	55.0

## Australia (Contd.):

Customs duties on other fishing equipment are:

	BPT	MFN
Floats for fishing nets	Free	7.5
Fish hooks . . . . .	Free	10.0
Fishing and rabbit nets and netting . . . . .	Free	7.5

Other Fisheries Regulations: Specific regulations governing the operation of various Australian fisheries are issued by the State Government concerned and by the Commonwealth Government. (United States Embassy, Canberra, April 24, 1964.)

Notes: (1) BPT = "British Preferential Tariff"--applies to goods of United Kingdom origin.

(2) MFN = "Most Favored Nation Rates"--goods of United States origin fall within this category.

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# DIRECT FISH LANDINGS BY FOREIGN VESSELS RESTRICTED:

The Australian Government is said to have amended the tariff regulation restricting direct exports to Australia of fish taken by foreign fishing vessels, according to the Japanese Fisheries Agency. Direct export is defined as export of catches not landed in a foreign port prior to their entry into Australia for unloading or transshipment. Exports to Australia of fish transshipped from another foreign port are permitted, provided their entry has been approved and documented by the Australian Minister of Primary Industries.

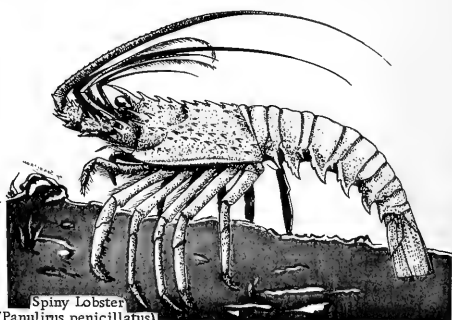
According to a survey made by the Japanese Fisheries Agency, Japan's 1963 direct exports by Japanese fishing vessels to Australia of frozen tuna (which form the bulk of frozen fish exports to that country) amounted in value to US\$5,781 for bluefin, \$6,694 for skipjack, and \$1,611 for albacore--a total of \$14,086. (Suisan Keizai Shimbun, May 2, 1964.)

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# SPINY LOBSTER TAGGING PROJECT:

Spiny lobster tagging was carried out in the Abrolhos Islands area of Western Australia during January 22-February 12, 1964, by 2 teams from the West Australian State Fisheries Department.

About 7,000 spiny lobsters were tagged with a plastic dart tag inserted between the second and third tail segments. The tag has a barbed plastic shank to which is attached a spaghetti-like orange plastic tube bearing the letters F.D. and a serial number. The tag is 3½ inches long and the diameter of the tube



Spiny Lobster  
(*Panulirus penicillatus*)

one-twelfth of an inch. When the spiny lobster sheds its shell (moults), the barbed shank should hold the tag in the flesh so the new shell will grow around it. Some tags will be lost, of course, during the moulting process.

The purpose of the program is to obtain information on growth rates. Spiny lobsters only grow during a moult, so tagging was planned to take advantage of the general mature spiny lobster moult which takes place during February and March.

The spiny lobster commercial fishing season opened March 15, 1964, in the Abrolhos Island area. For the project to be successful, the cooperation of fishermen is required. Investigators need every tagged spiny lobster caught. (Australian Fisheries Newsletter, March 1964.)

\* \* \* \* \*

# TROUT FARM PLANNED IN TASMANIA:

Australia's first fresh- and salt-water trout farm has been proposed for a site in Bridport, Tasmania. The Australian businessman sponsoring the project has engaged a Danish expert to help in the venture, and applied to the Tasmanian State Government for a license under legislation approved in 1963. Discussing his plans, the Australian businessman said, "Our target will also be the salmon

## Australia (Contd.):

market. Australia imported about 8 million pounds of canned salmon from Japan and Canada in 1962, and we believe we can compete with the imported product, using rainbow trout. Ultimately it is hoped to produce fresh, frozen, and smoked fish for Australia and overseas." He said that later efforts might be made to build up a trade in trout eggs to supply fish farms in the United States and Europe.

An application has been made to the Tasmanian Government to use land on a mudflat adjacent to the Brid River for the trout-rearing station. Later it is hoped to develop another 50 acres of the Bar Marsh area near the Brid estuary.

Fresh water for the station would be drawn from the Brid River. As the station grows more water could be drawn from the Great Forrester River and nearby creeks. The initial plan is to reclaim the mudflat on the south side of the Brid River estuary for a series of fresh-water rearing ponds. The Bar Marsh section might become a fattening station where fish would be transferred when they were large enough to withstand sea water. However, the Bar Marsh would not be developed until more was known about the behavior of trout in salt and fresh water.

If early approval of the venture is received, a small number of trout might be harvested from the fish farm in 1965. (Australian Fisheries Newsletter, March 1964.)



## British West Indies

OUTLOOK FOR BARBADOS  
SHRIMP FISHERY PROMISING:

By the end of 1963 it became evident that the actual potential of the newly established frozen shrimp enterprise in Barbados, operated by United States interests, had been underestimated by both the Barbados Government and the company management. Initially, the Barbados fishery company planned for a gradual increase in its United States-owned and operated trawler fleet of 25 vessels, and the Government had agreed to expand the inadequate cold-storage and freezing facilities of the Barbados Marketing Corporation to accommodate the shrimp landings anticipated.

Later, because the Government appeared reluctant to go along with the company's revised expansion plans, the company indicated that it would withdraw its base of operations. However, an agreement was finally reached and the company is now talking in terms of a 100-trawler fleet which would make Barbados one of the largest fishing fleet centers south of Tampa, Fla. If the plans for expansion develop, it is anticipated that 2 million pounds of frozen shrimp will be exported from Barbados within a 2- to 3-year period.

The year 1963 was summed up as a poor year for the local fishing industry in Barbados. The major problem to be overcome is the lack of capital for buying the equipment necessary which would permit fishermen to go beyond the shore line and engage in deep-sea fishing operations. (United States Consulate, Barbados, April 24, 1964.)



## Cambodia

COMMERCIAL FISHERIES  
PRODUCTION, 1960-1963:

The commercial production of fishery products in Cambodia showed a general increase during the period 1960-1963.

Table 1 - Commercial Production of Fisheries Products in Cambodia, 1960-1963

Product	Unit	1963	1962	1961	1960
Fresh fish	Metric Tons	31,390	24,006	20,034	25,858
Dried fish	"	6,808	6,267	1,952	1,752
Smoked fish	"	1,932	1,000	4/	5/
Shrimp	"	109	164	83	45
Kapikl/	"	66	62	41	46
Fresh crabs	"	179	86	23	28
Salted crabs	"	53	55	9	11
Prahok	"	2,169	105	70	85
Tuk trey	Hectoliters	4,527	3,117	3,126	3,799

1/ Shrimp paste.

2/ Fish paste.

3/ Autolyzed fish liquid.

4/ Production reported in "hand" units as 1.5 million "hands."

5/ Production reported in "hand" units as 580,000 "hands."

Source: Cambodian Government Fisheries Source.

Statistics on fisheries production in Cambodia understate the total commercial catch, since a considerable part of the marine catch is delivered outside Cambodia. In addition, a substantial amount of the fresh-water fish catch by family or subsistence fishermen enters commercial channels without being recorded in official statistics (see table 2 on following page). (United States Embassy, Phnom Penh, April 24, 1964.)

## Cambodia (Contd.):

Table 2 - Major Species Which Comprise 90 Percent of the Commercial Catch

Family: <u>Cyprinidae</u> (Carp):
<u>Leptobarbus hoeveni</u> , <u>Dangila siamensis</u> , <u>Thynnichthys thynnoides</u> , <u>Osteochilus melanopleura</u> , <u>Osteochilus hasselti</u> , <u>Cirrhinus auratus</u> , <u>Laboe chrysophekadion</u> .
Catfishes of several families:
<u>Clarias batrachus</u> , <u>Wallago attu</u> , <u>Cryptopterus apogon</u> , <u>Pangasius</u> (3 species)
Other species from various families:
<u>Ophiocephalus</u> (several species), <u>Anabas testudineus</u> , <u>Pseudosciaena soldado</u> , <u>Oxyeleotris marmorata</u> .



## Republic of Cameroon

CHINESE TUNA VESSELS TO  
TRAIN CAMEROON FISHERMEN:

Two Nationalist Chinese tuna fishing vessels arrived on the west African coast at Douala on April 4, 1964, to begin training work with Cameroon fishermen. The tuna fishing training program is for 18 months under an accord signed in September 1963 by the Republic of China and the Republic of Cameroon. Plans call for each Chinese crew to work intensively with a group of 3 trainees for a 4-months period.

The tuna vessels are the Chung Yu 501 and Chung Yu 502 (each 197 feet long with a net displacement of 600 metric tons and a hold capacity for 400 metric tons of frozen fish). The vessels are equipped for long-line fishing. On each vessel, refrigeration equipment can turn out 6 tons of ice a day and freeze 15 tons of fish an hour. After freezing, the catch will be stored in compartments at temperatures less than 20° F. Each vessel, with a crew of 30 seamen and 10 officers, carries such modern equipment as radar and sonar. A smaller vessel of 10 tons, carried by one of the larger tuna vessels, will be used for coastal fishing.

According to press sources, the tuna caught on the high seas will be sold either in Abidjan in the Ivory Coast, or Monrovia in Liberia. The port of Douala lacks the refrigeration and canning facilities which are available at Abidjan and Monrovia. (United States Embassy, Yaounde, April 10, 1964.)

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## Canada

BRITISH COLUMBIA CANNED SALMON  
INDUSTRY ASKS FOR TARIFF REDUCTION  
AT 1964 GATT NEGOTIATIONS:

The Fisheries Association of British Columbia filed a statement March 16, 1964, with the Canadian Tariffs and Trade Committee concerning the scheduled 1964 trade negotiations in Geneva under the General Agreement on Tariffs and Trade. Pointing out that the salmon canning industry of British Columbia is export oriented, the Association recommended that Canadian representatives make every effort to halt the upward movement of tariff rates on canned salmon in European countries. More favorable tariff conditions in the United States were also mentioned as objectives for Canadian negotiators.

The United Kingdom offers a duty-free market to Canadian canned salmon and absorbs most of British Columbia's exports of canned sockeye salmon, but the Province's canned pink salmon pack has a much wider market. Until common tariffs began to be imposed in member nations of the European Economic Community, Canadian canned salmon enjoyed free entry into both Belgium and the Netherlands. Now both countries impose a 5.4 percent duty on Canadian canned salmon and Belgium adds an additional 6-percent internal tax. The highest consumer prices for canned salmon are found in France which imposes an import duty of 18 percent as well as the French consumers tax. That is said to be one of the reasons that France, with more than 5 times the population of Holland, purchases only slightly more canned salmon from Canada than the Dutch.

The Fisheries Association of British Columbia also discussed the export market situation in Australia and New Zealand. The Association has sent representatives twice in the last three years to appear before the Australian Tariff Commission. The Canadian salmon industry wishes to preserve the export market in Australia which permits unrestricted entry of Canadian canned salmon on the nominal duty basis of 1d. (1.17 U. S. cents) per pound.

In concluding, the Association's brief said "in return for any concessions made, concessions should be received which will have the effect of broadening the market area for our products or of reducing that part of the cost to our foreign customers which is represented



Canada (Contd.):

by import tariff rates." (Facts on Fish, April 9, 1964, Fisheries Association of B.C.)

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**SMALL STERN-FISHING FACTORYSHIPS  
ORDERED BY NEWFOUNDLAND  
FIRM FROM DUTCH SHIPYARD:**

In the fall of 1964, a Dutch shipyard is expected to deliver the first in a series of 4 small stern-fishing factoryships ordered by a Canadian fisheries firm in St. John's, Newfoundland. The main dimensions of the vessels will be: overall length 164 feet, beam 29.5 feet, and moulded depth 22.7 feet.

The factory trawlers have been designed so that their catch will be hauled aboard a stern chute. On a sheltered quarterdeck, the fish will be processed mechanically, and then stowed in refrigerated holds. Filleting machines, freezing equipment, and an ice-making machine will be located below deck.

The fish hold of each vessel will have a capacity of 14,120 cubic feet, and each vessel will be able to land about 280 tons of frozen fish or 320 tons of fresh iced fish. Each of the factoryships will have a crew of 20. (Commercial Fishing, March 1964.)

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**NEW COMMITTEE FORMED FOR  
DEVELOPMENT OF  
FRESH-WATER FISHERIES:**

A national program for the development of Canada's fresh-water fisheries was implemented early in May with the formation of a Federal-Provincial Prairie Fisheries Committee, announced the Canadian Department of Fisheries on May 12, 1964. Members of the new Committee are the Deputy Ministers of Federal and Provincial departments responsible for fisheries.

At a two-day organizational meeting, the committee, which is a result of the Federal-Provincial Conference on Fisheries Development held in Ottawa last January, adopted terms of reference, to be ratified by the governments concerned, and appointed subcommittees to make recommendations for industrial development and research. It received a progress report from a study group on marketing problems.

The Chief of the Fish and Wildlife Branch of the Ontario Department of Lands and Forests represented Ontario which was invited to send a representative to the meeting because the fisheries problems of its northern lakes are similar to those of the Prairie Provinces and the Northwest Territories.

The main purpose of the committee, which is similar in concept to the Federal-Provincial Atlantic Fisheries Committee, is to provide for the orderly and progressive development of a healthy and economic fisheries and to that end to coordinate, where practicable, the activities in the respective fields of responsibility of its members. The committee is expected to make recommendations to the respective governments for the implementation of fisheries programs and projects of common concern. These recommendations would include the development of methods and techniques in the catching of fish and of shore and plant facilities, and studies on the economics of fisheries to ensure that any proposed program of development is soundly based.

A second meeting, for reports on progress, is to be held at Winnipeg, Manitoba, in the fall of 1964.



**Chile**

**FISH MEAL INDUSTRY TRENDS,  
FIRST QUARTER 1964:**

After relatively good fishing during January and early February 1964, the fish reduction industry of northern Chile was again faced with a scarcity of raw material in March. Anchoveta, the commercial fish of the northern fish meal plants, disappeared off Arica February 20 and had not returned by mid-April. Off Iquique, anchoveta continued to be found in abundance until the second week of March 1964. Then, for almost a month, few Iquique vessels found sufficient fish to make their trip worthwhile until mid-April, when anchoveta reappeared within reach of the Iquique fleet.

The absence of anchoveta from northern coastal waters of Chile in late February and early March has been noted in former years and was not viewed with alarm by the industry. The prolonged absence this year was believed to be due to the unseasonably warm

## Chile (Contd.):

weather through late March which may have moved the fish south out of reach of the northern fishing fleets. (Vessels taking anchoveta must be able to deliver their catch to the fish meal plants within a day or carry ice, which is not feasible.)

The Chilean Fisheries Development Institute, which became operative January 1, 1964, has leased a purse-seine vessel in order to speed up its study of anchoveta. (United States Embassy, Santiago, April 18, 1964.)



## Costa Rica

GREEN TURTLE REGULATIONS:

The Department of Fish and Wildlife of the Costa Rican Ministry of Agriculture is drafting regulations to control the capture of green sea turtles (*Chelone mydas mydas*) during the months that they appear in large numbers off the Atlantic Coast of Costa Rica (July, August, September). The plan may provide for the establishment of a buying agency by the Consejo Nacional de Produccion at Limon with agents at the Ports of Colorado, Tortuguero, and Paraismina. The plan reportedly will authorize the Consejo to sell turtle meat at retail through its sales agencies and also wholesale the turtle meat to retail meat shops throughout Costa Rica.

The new regulations will implement Decree No. 9 of May 24, 1963, published in the Official Gazette of May 30, 1963. Following are the main provisions of Costa Rican Decree No. 9:

Article (1) Permits for the capture of green sea turtles shall be issued by the Ministry of Agriculture and Livestock.

Article (2) Permits for capturing green sea turtles shall be extended only for the period during which the turtles arrive at the Costa Rican coast--June, July, and August--and shall expire on August 31.

Article (3) The capture of green sea turtles for commercial purposes is prohibited on the beaches and for a distance of 1 kilometer (about 0.62 mile) inland, measuring from the high-tide mark.

Article (4) The unloading of captured green sea turtles shall be permitted only when the proportion of females does not exceed 50 percent of total lot.

Article (5) The concessionaire (permit holder) shall notify the appropriate fisheries authorities at Limon of the number of turtles captured during each voyage and the areas where they were taken.

Article (6) Live captured turtles can be kept in pens for a period not to exceed 15 days. Turtles which have been captured by harpoon must be slaughtered within 24 hours after unloading.

Article (7) The exportation of turtles shall be subject to the following conditions: (a) approval by the Ministry of Agriculture and Livestock on each export shipment of live or processed turtles; (b) approval by the Ministry of Agriculture and Livestock on each export shipment of turtle shells ("caparazones") or other type of product; (c) the exportation of live turtles shall be authorized only after the national (local) demand for them has been satisfied; (d) applications for export permits shall be filed with Fish and Wildlife Office of the Ministry of Agriculture and Livestock, specifying the legal qualifications of the applicant, a description of the product to be exported, the destinations, and respective value.

Decree No. 9. was signed by the President of the Costa Rican Republic, May 24, 1963. (United States Embassy, Costa Rica, April 3, 1964.)



## Cuba

EQUIPMENT FOR NEW FISH CANNERY BUILT IN ESTONIA:

Machinery and equipment for a fish cannery in Cuba is reported to have been built in the Estonian Socialist Soviet Republic. The plant, in the Havana Bay area, will have a daily capacity of about 4,500 pounds of finished product. Soviet technicians were to be sent to Cuba to help set up the equipment. (Unpublished source.)



## Denmark

### FISHERIES DEVELOPMENTS, APRIL 1964:

Separate Fishery Negotiations Sought at GATT Sessions: A proposal to seek separate negotiations on fishery products rather than have them included with agricultural commodities during the Kennedy Round at Geneva was discussed at the early April 1964 meeting of the Nordic contact committee on fishery problems. The proposal was made because it was feared that the difficulties involved in the agricultural negotiations would overwhelm the fishery discussions.

**Continued Dispensation on Undersized Whiting Requested:** Denmark plans to request a prolongation of the dispensation from the North Sea Convention which permits its fishermen in vessels with not over 150 hp. to use nets with less than the prescribed size mesh and to land whiting less than the minimum size of 23 centimeters (9 inches) in unlimited quantity if taken in prescribed areas of the Kattegat and Skagerrak. The dispensation originally expired May 1, 1963, but was extended for another year. The whiting catch is used mainly for pond trout food and mink food by Denmark's nearly 600 trout-pond operators and about 4,000 fur farmers. Some whiting is processed into fish meal. Danish biological studies show no adverse effects on the resource fished nor on the fishery for whiting for human food in other areas. Danish whiting landings for all purposes in 1963 amounted to about 55,000 metric tons, which is a new record.

**Processing and Distributing Plaice:** Packaged frozen plaice fillets are reported to cost the Copenhagen consumer 2-1/2 times as much as the fisherman received for the plaice from which they were processed, according to a Danish newspaper reporter and a fishery exporter. Their calculations were based on a package of frozen fillets selling at a Copenhagen supermarket for Kr. 3.95 (57.3 U.S. cents). The 8 fillets in the package weighed 450 grams (about one pound). On that basis, the retail cost of two fillets from one plaice was about Kr. 0.99 (14.4 cents).

In Danish retail fish stores, plaice usually are sold alive and filleted to order--an example of Danish insistence on quality. The frozen product is handled in other types of stores having the right to sell frozen foods. Such frozen food outlets may be tripled in 1966 if proposed legislation is approved.

**Fisheries Limits--Skagerrak:** Regulation of the fisheries and fisheries limits in the Skagerrak--the rich fishing area between Norway, Sweden, and Denmark--was an agenda item at the early April meeting of the Nordic contact committee on fishery problems. The discussion was in general terms and mainly exploratory with respect to the intentions of those three countries. No conclusions were reached, and no proposals are expected until there has been further study and another meeting.

The probable substantial increase in the Skagerrak herring fishery predicted for the coming winter and a number of years in the future by a noted Norwegian biologist has brought some urgency to the matter of fisheries limits and

rights in that area. Norway, Sweden, and Denmark naturally wish to preserve as much of the fishing area as possible for their own fishermen if the herring are to return as they have done in about 100-year cycles for a thousand years, according to predictions.

**Fisheries Limits--Denmark:** Extension of Denmark's fisheries limits to 12 miles, as provided in the agreement reached at the Western European Fisheries Conference in London in February, was expected would come with deliberate speed. Introduction of the necessary legislation in the Danish Parliament probably will be preceded by negotiations with West Germany and the Netherlands with respect to their fishing rights in Danish waters. Discussions of the proposed fisheries limits between Denmark's Fisheries Ministry and the Danish fisheries associations were reported to be just beginning about mid-April. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 22, 1964.)

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## FISHERIES TRENDS,

### JANUARY-MARCH 1964:

**Landings:** Denmark's fishery landings in January-March 1964 were down about 5 percent from the same period in 1963 because of stormy weather and less abundant industrial fish. The usual large Norway pout fishery--132,000 metric tons in 1962--dropped to 97,000 tons in 1963, presumably because of a poor year-class, but that fishery could recover in 1964. The common sole fishery, which declined about 80 percent in 1963 as compared with 1962 (because of the severe winter), is not expected to recover fully until 1966 or 1967. The North Sea herring fishery should give good yields in July and August of this year, according to Danish biologists. If the Norwegian herring follow a famous Norwegian biologist's predictions, as they seem to be doing--there should be a good herring fishery this coming winter in the inner Skagerrak and possibly on the Jutland banks in the North Sea. Unless the industrial fish catch improves, the current shift of cutters to fishing for foodfish could result in a somewhat smaller but more valuable total catch by Danish fishing vessels in 1964.

Since Denmark's fishery for undersized whiting, under a dispensation from the North Sea Convention, has not affected the whiting resources fished for either industrial or food uses according to their biologists, Denmark expects a renewal of the dispensation which expired May 1, 1964. Should this dispensation not be granted, the whiting fishery (55,000 metric tons in 1963) would be seriously curtailed.

**Exports:** Danish exporters of fishery products look forward to a favorable year for exports in 1964 if landings equal or surpass those of 1963. For the first quarter of 1964, total fishery exports were about 4 percent less in quantity but 12 percent greater in value than during the comparable period in 1963. Denmark's exports of fishery products to the United States in the first quarter of 1964 were down about 40 percent in quantity and value from the same period in 1963. Pond trout exports were about 65 percent less in value, cod exports were down about 50 percent, and canned herring and brisling exports dropped about 20 percent. Canned shrimp exports were about the same as the same period in 1963, but Norway lobster exports increased about 130 percent.

**New Developments:** A new development in 1964 has been the importing of fillet waste from the United States and Canada to supply food for Danish and Swedish fur animal (mink) farms. Prices (f.o.b. Gloucester, Mass., at just under 2 cents a pound per metric delivery in Denmark at about 3-1/4 cents a pound when shipped in large lots.

Costs of Processing and Distributing Frozen Packaged Plaice Fillets in Denmark

	öre/1	¢
Cost of one plaice at auction . . . . .	41.0	5.9
Income from filleting waste sold for trout or fur-animal food . . . . .	-8.4	-1.2
Net cost of fish . . . . .	32.6	4.7
Direct labor . . . . .	14.0	2.0
Packaging . . . . .	3.3	.5
Depreciation and interest . . . . .	4.5	.7
Cost of processed fillets . . . . .	54.4	7.9
Processor's and wholesaler's profit--about 18% on wholesale price . . . . .	11.6	1.7
Wholesale price . . . . .	66.0	9.6
Retailer's profit--about 33% on retail price . . . . .	33.0	4.8
Retail price . . . . .	99.0	14.4

1/One Danish krone (100 öre) equals U. S. \$0.145.

## Denmark (Contd.):

Because of the failure of the bluefin tuna fishery in Norway and Denmark last season, Japanese-caught big-eyed tuna were imported by Danish canners at \$350 a metric ton f.o.b. Italy. When trucked to Skagen the total cost was \$400 a ton. (Tuna producers in New England have been informed of Danish canners as a potential tuna market.)

**United States Market:** Lower prices in the United States market do not seem to be of especial concern. Alternate markets for cod fillets, for example, are being sought, and found, in England and on the Continent by Danish, Faroese, and Greenland producers. Pond trout sell as profitably in Europe as in the United States. However, the Danish Consulates General in New York, Los Angeles, and Chicago have reported to Danish processors that there is an increasing demand for Danish canned and frozen fish in those areas, and the Danish fisheries attaché post in New York is to be filled.

Danish sardine canners cannot compete in the United States market with Maine canners for the less expensive canned sardine market when the Maine pack is normal, but Danish specialties, such as canned brisling in wine sauce, enjoy good United States markets. Currently, Danish canners are having difficulty competing with Canadian sardine canners on the world market. When possible, Danish canners try to market higher priced specialties. They pay about \$58 per metric ton to the fishermen for herring and about \$70 per ton for brisling. (Regional Fisheries Attaché for Europe, United States Embassy, Copenhagen, April 29, 1964.)

\* \* \* \* \*

INDUSTRIAL PRODUCTS SUPPLY  
AND DISTRIBUTION, 1963:

**Fish Meal:** The Danish supply of fish meal in 1963 was only 1.5 percent less than in the previous year. Domestic production accounted for most of the supply, although Iceland shipped 8,706 metric tons of fish meal (more than half was herring) to Denmark in 1963, and Norway supplied 3,508 tons (somewhat less than half was herring). A small quantity (93.5 tons) was also received from the United States.

Distribution of the Danish fish meal supply in 1963 was about the same as in 1962. A mod-

Table 1 - Danish Fish Meal Supply and  
Distribution, 1962-1963

Item	Quantity	
	1963	1962
	(1,000 Metric Tons)	
<b>Supply:</b>		
Stocks on hand January 1	3.6	4.0
Domestic production	1/95.0	2/93.1
Imports	12.3	15.5
Total supply	110.9	112.6
<b>Distribution:</b>		
Domestic consumption	47.3	52.5
Exports	60.1	56.5
Stocks on hand December 31	3.5	3.6
1/Estimated.		
2/Revised.		

erate decline in domestic use for animal feed in 1963 was about offset by a gain in exports. The principal buyers of Danish fish meal (mostly herring) in 1963 were the United Kingdom with 31,255 tons, West Germany with 6,793 tons, Poland with 5,529 tons, Switzerland with 4,277 tons, Finland with 3,269 tons, Sweden with 2,809 tons, and the Netherlands with 2,023 tons.

**Marine Oils:** Refined oils from Peru made up a large part of Denmark's marine oil imports, although the imports in 1963 also included sizable shipments of crude marine oils from Peru. Danish production of hardened or refined marine and animal oils amounted to 25,000 tons in 1963 and 24,912 tons in 1962. Domestic production of crude fish oil (including herring oil)--the major factor in Danish production of crude--amounted to 25,000 tons in 1963 and 24,697 tons in 1962. Domestic production of other crude marine oils (whale, seal, and other) in Denmark amounted to 2,081 tons in 1962 (comparable data for 1963 is not yet available).

Table 2 - Danish Imports of Marine Oils, 1962-1963

Commodity and Country of Origin	Quantity	
	1963	1962
	.. (Metric Tons) . . . .	
<b>Whale oil, crude:</b>		
Norway	7.6	7.2
Netherlands	0.2	-
Total	7.8	7.2
<b>Sperm oil, crude:</b>		
Norway	36.2	-
West Germany	10.6	-
Total	46.8	54.8
<b>Seal oil, crude:</b>		
Norway	13.3	17.8
<b>Herring oil, crude:</b>		
United States	1,221.8	-
West Germany	-	1,214.3
Iceland	1,223.4	507.0
Norway	78.3	139.8
United Kingdom	21.8	-
Total	2,545.3	1,861.1
<b>Other marine oils, crude:</b>		
Peru	3,449.3	-
Norway	19.8	-
United Kingdom	2.0	-
Total	3,471.1	26.4
<b>Marine oils, refined:</b>		
Norway	130.0	298.7
Peru	15,326.6	17,271.4
Other countries	12.3	38.8
Total	15,468.9	17,608.9
<b>Marine oils and other animal oils, hardened:</b>		
Norway	1,071.9	582.6
Sweden	5,647.3	2,812.1
Other countries	-	1.9
Total	6,719.2	3,396.6

## Denmark (Contd.):

Table 3 - Danish Exports of Marine Oils, 1962-1963		
Commodity and Country of Destination	Quantity	
	1963	1962
	(Metric Tons) . . .	
Whale oil, crude:		
West Germany . . . . .	0.4	12.6
Seal oil, crude:		
Total all countries <sup>1/</sup> . . . . .	77.1	79.4
Herring oil, crude:		
Finland . . . . .	977.4	813.3
Norway . . . . .	972.2	4,299.1
Sweden . . . . .	683.3	1,508.3
Czechoslovakia . . . . .	1,194.4	434.8
Netherlands . . . . .	299.8	-
United Kingdom . . . . .	14,205.8	4,058.7
West Germany . . . . .	1,085.6	1,870.5
East Germany . . . . .	-	99.8
Total . . . . .	19,418.5	13,084.5
Other marine oils, crude:		
West Germany . . . . .	598.5	738.7
Czechoslovakia . . . . .	100.0	1,073.6
Other countries . . . . .	326.0	288.9
Total . . . . .	1,024.5	2,101.2
Marine oils, refined:		
Total all countries <sup>2/</sup> . . . . .	312.3	50.2
Marine oils and other animal oils, hardened:		
Colombia . . . . .	1,105.0	2,850.0
Other countries . . . . .	1,011.9	1,653.0
Total . . . . .	2,116.9	4,503.0

<sup>1/</sup>Mostly to West Germany, and some to Sweden.

<sup>2/</sup>Mostly to Norway and West Germany, and a small quantity to Sweden.

Crude herring oil accounted for the bulk of Danish exports of marine oils. (United States Embassy, Copenhagen, April 16, 1964.)

Note: See Commercial Fisheries Review, July 1963 p. 73.



## Ethiopia

## NEW COMPANY WILL HANDLE FISHERY PRODUCTS:

Organization of an Ethiopian-Bulgarian company which will engage in shipping, fishing, and other activities was announced early in 1964. The capital of the company has been reported as Eth\$2 million (US\$800,000), of which one-fourth is paid up. It appears that 16,980 shares of the company's 20,000 registered shares are held by a Bulgarian Government organization.

The new company has registered four cargo ships under the Ethiopian flag to engage in general shipping between ports on the Red Sea, Mediterranean Sea, and Black Sea. The newly registered cargo vessels are under-

stood to have previously been the property of a Bulgarian organization, and the vessels will initially be manned by Bulgarian or other foreign crews. In the future, a training program for Ethiopian seaman may be arranged.

Four new 300-ton fishing vessels are to be acquired by the company. Each fishing vessel will have refrigeration equipment to store 120 metric tons of fish at 0° C. (32° F.).

The company will obtain fish both from its own fleet and from local fishermen. Edible fish will be frozen, presumably for the European market, and the remainder will be processed as fish meal. A freezing plant, fish meal plant and ice plant will be built near Massawa, Ethiopia, in an area north of the city. The freezing plant will have a minimum capacity of 30 tons a day and a maximum capacity of 80 tons. The capacity of the fish meal plant will be 60 tons of raw fish a day. The ice plant will be capable of producing 60 tons of ice a day. A pier will also be built. (Unpublished sources.)



## German Federal Republic

## FISHERIES RESEARCH VESSEL

## "WALTHER HERWIG" COMMISSIONED:

The Walther Herwig was commissioned as West Germany's second fisheries research vessel on October 28, 1963. Specifications of the vessel are: length overall 83.2 meters (272.9 feet), width 12.5 meters (41.0 feet), gross tonnage 1,987 tons, and net tonnage 889 tons. The vessel is powered by a 2,000 horsepower engine.

The Walther Herwig will operate in the Atlantic Ocean and will be used primarily for marine and fisheries research. The vessel began its first cruise November 25, 1963, when it sailed for the west coast of Greenland to carry out fisheries biological investigations. (International Commission for the Northwest Atlantic Fisheries Newsletter, No. 44.)



## Greece

## FREEZER-TRAWLER LANDINGS, JANUARY-FEBRUARY 1964:

During February 1964, two Greek freezer trawlers and two refrigerator vessels landed

## Greece (Contd.):

992 tons of frozen fish at the port of Piraeus, down 36 percent from the same month a year earlier but 11 percent more than in February 1962. In January 1964, a total of 2,250 tons of frozen fish was landed by five freezer trawlers and one refrigerator vessel.

Total landings of frozen fish in January-February 1964 of 3,242 tons increased 11 percent from the 2,934 tons landed in the same period of 1963. (Alieia, March 1964.)

\* \* \* \* \*

#### NEW EXPERIMENT TO USE FISH MEAL AS FISH FOOD:

The Government of Greece is starting an experiment--a new use for fish meal. If it is successful, a sizable new market for the product might be created. The experiment, to be carried out by the Greek Ministry of Industry's Department of Fisheries, is to import from Denmark 3 or 4 tons of fish meal which is to be used as fish food at 3 trout hatcheries in Greece.

Because Greece's Mediterranean waters no longer provide enough food fish and yields from the distant Atlantic Ocean fishing grounds are declining, the Greek Department of Fisheries hopes to help meet the demand for food fish with hatchery-reared fish, and possibly salt-water fish from estuaries.

The Director of the Greek Department of Fisheries cited the pioneer work done in Denmark in the use of fish meal as fish food. He said:

"In 1946 Denmark produced 400 tons of trout fed from fish meal, and in 1961 the total was 7,500 tons. The research workers there found that with fish meal they could grow a marketable fish in 18 months."

The three hatcheries in Greece include a state hatchery at Jannena, in northwestern Greece, a second under construction at Edessa in Macedonia, and a private hatchery near Laevadia, about 80 miles northwest of Athens.

The possible significance of the experiment to fish-meal producers would be in supplying the hundreds of state and private fish hatcheries scattered throughout Greece. Another possibility would be smaller sales of fish meal to farmers and others maintaining fish

ponds, either to supply their own tables or to provide fishing on a paying basis to others. Farmers are encouraged to dam streams and thus make small lakes which are stocked with fish.

The Department of Fisheries also plans to later try fish meal as a fish food on fish in the brackish waters of many estuaries of the seas almost surrounding Greece. About 100 of those are now being developed by the Government and exploited under concession by private firms and fishermen's cooperatives. The inlets being developed have narrow entrances which can be closed with a bamboo dike or weir in the spring and summer to admit water but prevent escape of the fish. The fish are now allowed to grow naturally in the inlets, but enrichment of their natural food supply with fish meal might well stimulate more growth. The hoped for results are larger fish and lower prices to the consumers.

A parallel experiment, said the head of the Department of Fisheries, may be in attempting to stimulate plankton growth in the estuaries by introduction of nutritious chemicals such as nitrogen and phosphates. Since fish feed on plankton, they would benefit from having a better natural food supply. He added, however, that feeding of fish meal will be more successful, if for no other reason than that it eliminates the intermediate step of feeding plankton. (Alieia, March 1964.)



## Iceland

#### FISHERY LANDINGS BY PRINCIPAL SPECIES, 1962-1963:

Species	Year	
	1963	1962
... (Metric Tons), ...		
Cod . . . . .	235,201	223,449
Haddock . . . . .	51,215	54,276
Saithe . . . . .	14,321	13,469
Ling . . . . .	5,566	7,073
Wolfish (catfish) . . . . .	17,442	13,368
Cusk . . . . .	5,832	5,283
Ocean perch . . . . .	32,867	22,273
Halibut . . . . .	1,221	1,540
Herring . . . . .	395,166	478,127
Shrimp . . . . .	649	699
Capelin . . . . .	1,077	-
Lobster . . . . .	5,179	2,474
Other . . . . .	7,866	10,053
Total . . . . .	773,602	832,084

Note: Except for herring which are landed round, all fish are drawn weight.

\* \* \* \* \*

## Iceland (Contd.):

## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-NOVEMBER 1963:

Species	January-November	
	1963	1962
	... (Metric Tons) ...	
Cod	226,508	217,968
Haddock	46,850	50,351
Saithe	13,722	12,585
Ling	5,318	6,846
Wolffish (catfish)	17,077	13,283
Cusk	5,473	4,984
Ocean perch	31,718	21,398
Halibut	1,112	1,483
Herring	384,879	424,569
Shrimp	603	532
Capelin	1,077	-
Loabster	5,177	2,474
Other	6,297	9,866
Total	745,811	766,339

Note: Except for herring which are landed round, all fish are drawn weight.

\* \* \* \* \*

## EXPORTS OF FISHERY PRODUCTS, 1962-63:

During 1963, there was a considerable increase in exports of frozen and salted herring, herring meal, and cod-liver oil as compared with 1962, according to the Statistical

Icelandic Fishery Exports, 1962-63						
Product	1963			1962		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried . . . . .	2,420	53,958	1,252	3,184	64,012	1,485
Salted fish, uncured . . . . .	18,990	235,321	5,552	25,349	305,874	7,050
Salted fish fillets . . . . .	1,114	14,346	333	1,320	17,423	404
Wings, salted . . . . .	1,529	18,793	436	1,045	12,032	279
Stockfish . . . . .	9,616	278,656	6,465	10,634	281,274	6,528
Herring on ice . . . . .	7,311	23,610	548	7,022	23,773	552
Other fish on ice . . . . .	36,161	202,066	4,688	30,864	167,999	3,898
Herring, frozen . . . . .	37,384	208,487	4,837	24,126	132,512	3,074
Other frozen fish, whole . . . . .	3,952	41,102	954	2,883	37,201	863
Frozen fish fillets . . . . .	47,903	895,954	20,786	50,200	884,272	20,315
Shrimp and lobster, frozen . . . . .	1,136	96,823	2,246	420	44,508	1,033
Roes, frozen . . . . .	860	14,869	345	720	15,680	317
Canned fish . . . . .	340	16,310	378	429	23,136	537
Cod-liver oil . . . . .	8,650	66,094	1,533	5,313	40,994	951
Lumpfish roes, salted . . . . .	324	5,322	123	449	6,823	158
Other roes for food, salted . . . . .	3,189	44,581	1,044	2,746	37,535	880
Roes for bait, salted . . . . .	1,745	12,571	293	1,407	8,831	205
Herring, salted . . . . .	57,282	555,053	12,808	47,290	469,008	10,881
Herring oil . . . . .	55,148	301,357	6,991	60,478	241,755	5,509
Ocean perch oil . . . . .	754	5,130	119	15	61	1
Whale oil . . . . .	3,444	24,483	568	1,687	13,660	317
Fish meal . . . . .	22,809	119,689	2,777	20,230	126,736	2,940
Herring meal . . . . .	76,583	439,681	10,200	48,489	314,420	7,295
Ocean perch meal . . . . .	4,028	18,667	433	437	2,451	57
Wastes of fish, frozen . . . . .	4,779	13,181	306	716	18,303	437
Liver meal . . . . .	442	3,036	70	320	2,129	49
Lobster and shrimp meal . . . . .	287	693	16	212	846	20
Whole meal . . . . .	100	558	13	602	3,286	76
Whale meal, frozen . . . . .	2,447	17,138	398	2,484	18,583	434

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

Bureau of Iceland's Statistical Bulletin, February 1964. Exports of frozen fish fillets and herring oil showed a decrease in 1963.

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## UTILIZATION OF FISHERY LANDINGS, 1962-1963:

How Utilized	Year	
	1963	1962
	... (Metric Tons) ...	
<b>Herring<sup>1/</sup> for:</b>		
Canning	296	335
Oil and meal	274,704	361,295
Freezing	37,722	34,888
Salted	76,642	69,621
Fresh on ice	5,802	11,988
<b>Groundfish<sup>2/</sup> for:</b>		
Fresh on ice	40,171	36,310
Freezing and filleting	168,894	164,854
Salted	71,566	88,135
Stockfish (dried unsalted)	72,559	44,471
Canning	47	-
Home consumption	14,837	13,379
Oil and meal	3,458	3,635
<b>Capelin for:</b>		
Freezing	188	-
Oil and meal	889	-
<b>Shrimp for:</b>		
Freezing	507	561
Canning	141	138
<b>Lobsters for:</b>		
Fresh on ice	2	-
Freezing	5,177	2,474
Total production	773,602	832,084

<sup>1/</sup>Whole fish.

<sup>2/</sup>Drawn fish.

Source: Aegir, April 1, 1964.

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## UTILIZATION OF FISHERY LANDINGS, JANUARY-NOVEMBER 1963:

How Utilized	January-November	
	1963	1962
	... (Metric Tons) ...	
<b>Herring<sup>1/</sup> for:</b>		
Canning	296	336
Oil and meal	271,489	334,221
Freezing	32,260	21,801
Salted	73,955	59,283
Fresh on ice	5,802	8,928
<b>Groundfish<sup>2/</sup> for:</b>		
Fresh on ice	34,375	31,280
Freezing and filleting	162,496	161,245
Salted	70,527	86,921
Stockfish (dried unsalted)	70,983	43,486
Canning	47	-
Home consumption	13,403	12,323
Oil and meal	3,321	3,509
<b>Capelin for:</b>		
Freezing	188	-
Oil and meal	889	-
<b>Shrimp for:</b>		
Freezing	475	446
Canning	128	86
<b>Lobsters for:</b>		
Fresh on ice	2	-
Freezing	5,175	2,474
Total production	745,811	766,339

<sup>1/</sup>Whole fish.

<sup>2/</sup>Drawn fish.

Source: Aegir, March 1964.

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Iceland (Contd.):

#### 20 NEW FISHING VESSELS DELIVERED BY BRITISH SHIPYARD:

The Jorundur II and an identical sister-ship, the Jorundur III, were delivered to Icelandic owners in March and April 1964 by a British shipyard in Selby. The dimensions of the new vessels are: length between perpendiculars 104 feet, length overall 119½ feet, moulded breadth 25 feet, moulded depth 12 feet, and gross tonnage 267 tons. Main power in both vessels is provided by an 800-horsepower Diesel engine. Both are equipped with variable pitch propellers.

Specifically designed for service in Icelandic waters, each vessel has a multipurpose fish deck which by its layout enables gear and fishing methods to be changed according to season. The vessels will probably operate as purse seiners in herring fisheries for 8 to 9 months out of the year, but they can also be used for trawling and long-lining.

The builder's description of the Jorundur II states, in part, "when trawling, the vessel employs fore and aft gallows on the starboard side, the aft unit of which is removed for purse-netting and long-lining operations. Twelve men are employed for trawling. Line fishing for cod requires a crew of 16 on Jorundur II--the extra numbers being engaged in hook-baiting... the line is paid out over a runner in the stern immediately beneath the boat deck... .

"The bulwarks of the fish deck and the section boards of the fish pounds are 15 inches higher than normal for the better retention of the herring catch; a gravity chute is used for the rapid transfer of the herring from fish deck to hold."

The total fishroom capacity of the Jorundur II was reported to be 9,630 cubic feet. Cooling grids maintain a fishroom temperature of 35° to 37° F. Two liver tanks with a combined capacity of 1,500 gallons are fitted forward of the fishroom on port and starboard sides.

Both Jorundur II and III were built to Lloyds Class 100 A1 "Trawler" specification, and strengthened for navigation in ice. The vessels are of all-welded construction and were built by unit prefabrication methods. Their design embodies a bar keel, cruiser stern, raked round-nose stem of clipper form, and

flush deck with whaleback. Though conventional in type and mechanical layout, the vessels were equipped with modern navigational and fish-finding electronic equipment.



## India

### INDO-NORWEGIAN FISHERIES DEVELOPMENT PROJECTS CONTINUED:

The Norwegian fisheries development project in India will be intensified during the fiscal year April 1, 1964-March 31, 1965. For work during that period, the Norwegian Government has provided an appropriation of Kr. 6.8 million (US\$952,000) and the Indian Government will also contribute substantial amounts. The basis for the cooperation is an agreement between India, Norway, and the United Nations concluded in 1952, and supplemented by later agreements in 1953, 1956, 1961, and 1963.

A chapter in the history of the Indo-Norwegian project was closed April 1, 1963, when Norwegian specialists withdrew from the villages of Sakthikulangara and Neendakara in the Province of Kerala where the project originally began. In that project area, a boatyard, engineering workshop, ice factory, and fish-freezing plant had been established.

The Norwegian specialists now plan to establish similar fishing stations at Cannanore in northern Kerala, Karwar in Mysore, and Madapam in Madras. It is estimated that construction of fishing facilities in those ports will be partially completed by the end of 1964.

The working program for the year also includes continued development of the fishery station in Cochin, Kerala, where the administration headquarters of the Indo-Norwegian fishery project is located. Plans also call for experimental fishing from the new stations. When the boatyards at the new fishing stations are put into operation, the training of local fishermen will begin.

A total of 26 Norwegian fishery specialists are now engaged in the fishery project in India. For most of the Norwegian positions, there are corresponding Indian positions, since the work will eventually be transferred entirely to Indian technicians.

The project is administered by Indian authorities in consultation with the Norwegian



## India (Contd.):

project director. Until recently, the overall administration of the project was under the Provincial Government in Kerala, but it has now been transferred to the Central Government in New Delhi. (United States Embassy, Oslo, April 12, 1964, and News of Norway, May 23, 1964.)

Note: See Commercial Fisheries Review, July 1963 p. 78, and February 1962 p. 69.



## Japan

## FROZEN TUNA TO BE EXPORTED TO CUBA:

A Japanese fishing company is reported to have notified the Fisheries Agency of its intention to export to Cuba a total of 1,070 metric tons of frozen tuna between early May and early June 1964. Four tuna vessels were expected to deliver the frozen tuna to Cuba. They are the Akashi Maru, Sakiyoshi Maru No. 21, Zenko Maru, and the Sakiyoshi Maru No. 25. They were to carry 160, 270, 370, and 270 metric tons of tuna, respectively.

The firm is reported to have traded in tuna with Cuba since 1960. The trade was subsequently temporarily terminated due to problems involving payment. The existing agreement covering the 1,070-ton shipment is reported to have been concluded in December 1963. (Shin Suisan Shimbun Sokuho, May 7, 1964.)

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## EUROPEAN BIG-EYED TUNA MARKET REPORTED SOFT:

The European market for Japanese-caught frozen big-eyed tuna was reported to have softened considerably in late April and early May 1964. The price of big-eyed (which sold to Italy for around US\$340-360 a metric ton c.i.f. in February) declined to about \$300 a ton. Even at that price, Italian packers were said to be reluctant to purchase big-eyed, but one packer purchased a shipment for \$285 a ton c.i.f. Also, Yugoslavia and Czechoslovakia were not purchasing any big-eyed at that time.

The sluggish European big-eyed tuna market is creating a problem for the Japanese Atlantic tuna fishery. One press report states

that the catches of the Japanese tuna vessels (about 160) operating in the Atlantic Ocean are running 40-60 percent big-eyed. Japanese trading firms are said to be seeking big-eyed outlets in northern Europe, but they have not yet made any significant progress. They are also said to be studying the possibility of shipping big-eyed back to Japan, but since the transportation cost would run up to around \$63 a ton, they hope to dispose of their big-eyed tuna supply in Europe.

In an effort to overcome the depressed big-eyed tuna market in Europe, one Japanese trading firm is seeking an outlet for that species in West Germany. The Japanese firm's market survey indicated good possibilities of developing a tuna market in West Germany, not only for big-eyed but for other species of tuna in less than fair marketable condition. A report from the Japan External Trade Organization (JETRO) representative stationed in that country also indicates that West German fish packers, faced with a supply shortage, want to buy Japanese tuna, regardless of quality, provided the price is acceptable. The report stated that German packers hope to process the lower grade tuna into smoked fish for domestic consumption. (Suisancho Nippo, May 11 & 12; Suisan Tsushin, May 8, 1964.)

Editor's note: Previous reports indicate that as many as 120 Japanese tuna vessels have operated in the Atlantic Ocean at one time. The 160-vessel figure in this latest report, if accurate, is a new high.

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## JAPANESE NEGOTIATE TUNA PRICES WITH U. S. PACKERS IN AMERICAN SAMOA:

The Japanese fishermen's associations, fishing companies, and trading firms involved in the American Samoan tuna base operations were reported in mid-April to be negotiating tuna price agreements with the two United States packing firms in American Samoa. As of mid-April, Japanese-caught tuna delivered to American Samoa were quoted at highs of US\$260 a short ton for iced round yellowfin tuna and \$320 a short ton for iced round albacore.

The Japan c. & f. export price of frozen tuna delivered to the United States as of mid-April was \$375 per short ton for gilled-and-gutted yellowfin and \$400 per short ton for round albacore. (Suisancho Nippo, April 17, 1964, and other sources.)

\* \* \* \* \*

Japan (Contd.):

#### JAPANESE FISHERY OFFICIAL'S VIEWS ON AMERICAN SAMOA TUNA BASE:

An official of the Japanese Fisheries Agency who visited American Samoa earlier this year has given the following views of his visit to the tuna base there:

Japanese tuna vessels delivering tuna to the two United States plants located on American Samoa now total about 50. This is in sharp contrast to the time when a fleet of 70 Japanese vessels was delivering tuna to just 1 of the 2 plants.

In 1962, the average catch in tons per day was about 3 tons, but is now barely 1.5 tons. According to Japanese fishing captains operating vessels out of American Samoa, they could make out adequately if they could catch an average of two tons of tuna per day. (Suisancho Nippo, April 22, 1964.)

\* \* \* \* \*

#### 1964 TUNA MOTHERSHIP REGULATIONS FOR TWO FISHING COMPANIES CHANGED BY GOVERNMENT:

The Japanese Government has notified two large Japanese fishing companies of changes made in the existing regulations governing tuna mothership fleet operations. The new regulations, applicable only for the 1964 fishing season, will affect their tuna mothership operations as follows:

1. The Yuyo Maru (5,040 gross tons) and Koyo Maru (7,500 gross tons) operated by one of the companies and licensed to fish with 55 and 45 catcher vessels, respectively, in the South Pacific Ocean off the Fiji Islands, must be accompanied by a catcher vessel fleet consisting of not less than 50 percent of the total number of catcher vessels authorized to accompany those motherships.

2. The Nojima Maru (8,800 gross tons) operated by the other fishing company and licensed to fish with 65 catcher vessels in the South Pacific Ocean off the Tahiti Islands, must be accompanied by a catcher vessel fleet consisting of not less than 60 percent of the total number of catcher vessels authorized to accompany that mothership.

3. For prevention of sea disasters, every catcher vessel must be equipped with wireless or radiotelephone so as to be able to

maintain close communication with its mothership or with other catcher vessels.

4. The Yuyo Maru and Koyo Maru fleets must operate within a radius of 1,000 miles from Suva, Fiji Islands. The Nojima Maru fleet must operate within a radius of 1,000 miles from Papeete, Tahiti Islands.

5. Catcher vessels must operate within close distance of their motherships.

6. Motherships must operate in areas where medical and other supplies, and repair services can be obtained readily from nearby bases (i.e., Suva and Papeete).

7. Fishing operations must be conducted in areas where ocean and weather conditions are relatively good.

The new tuna mothership regulations are viewed by the two fishing firms as imposing considerable difficulties on their operations. In previous years the Government had not stipulated the minimum fixed size of the mothership fleets, and the regulations requiring one company to contract not less than 50 percent, and the other company not less than 60 percent of the number of catcher vessels authorized to accompany their motherships are considered very difficult to comply with. (Suisancho Nippo, April 20, 1964.)

\* \* \* \* \*

#### AGREEMENT SIGNED FOR JOINT TUNA VENTURE IN CAPE VERDE ISLANDS:

The Japanese trading firm, which had been negotiating with a United States tuna packing firm and a Portuguese firm to establish a joint tuna base in the Cape Verde Islands, recently signed a formal partnership agreement with those firms to operate a joint base at Porto Grande, Sao Vicente Island. The base was to become operational in late May 1964.

Under the agreement, the Portuguese firm is to provide base facilities, which include a cold-storage plant; the Japanese firm is to supply fishing vessels; and the United States firm carrier vessels. Catches will be transhipped to the American firm's tuna plant in Puerto Rico and sold to the European and Japanese markets. The Japanese firm plans to contract three classes (190, 240, and 290 tons) of refrigerated long-line vessels from the Kanagawa Prefectural Tuna Fishermen's Co-

## Japan (Contd.):

operative Association and hopes to have at least 10 of them operate regularly out of the Porto Grande base.

Base facilities presently include one 700-ton cold-storage plant, the capacity of which will be enlarged to 1,700 tons (an earlier press report cited the figure 3,000 tons) by November; one small fishing vessel repair shop operated by the Portuguese firm; and one warehouse, with another under construction.

The Portuguese Government approved the joint venture on the condition that the Japanese vessels do not fish within Portuguese territorial waters. In the past, the Portuguese Government, which has always viewed with disfavor Japanese fishing operations in the Atlantic Ocean, had refused to permit Japanese vessels to use the Cape Verde Islands as a base of operation. (Nihon Suisan Shim-bun, April 24, 1964.)

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#### COMPLETION OF JOINT JAPANESE-BRITISH FIJI ISLANDS TUNA BASE DELAYED:

Construction of the joint Japanese-British tuna base at Levuka, Fiji Islands, originally scheduled to be completed in June 1964 was expected to be delayed for about one month due to problems on procurement of materials. Because of the delay the base will not become fully operational until August.

The Levuka tuna base is to be managed by a Japanese fisheries cooperative association, with cold-storage facilities to be operated by a joint Anglo-Japanese company. The base has an export quota of 9,000 short tons of tuna. (Suisancho Nippo, April 20, 1964; and other sources.)

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#### JAPANESE SUMMER ALBACORE FISHERY:

The 1964 Japanese summer albacore fishery, which began in late April 1964, reportedly continued slow as of early May. Indications were that fishing would get even poorer. Fishing conditions this year are reported to be entirely different from normal years, with the albacore schools distributed deeper below the surface of the Kuroshio current.

Some Japanese albacore fishing vessels were said to have switched to skipjack fishing, which was said to be relatively steady. Practically all the skipjack catches are being sold to the domestic fresh fish market at prices above 160 yen per kilogram (US\$403 a short ton). (Suisan Tsushin, May 4, 1964.)

\* \* \* \* \*

#### TUNA PURSE-SEINING EXPERIMENT IN SOUTH PACIFIC UNSUCCESSFUL:

The Japanese purse seiner Kenyo Maru (260 gross tons) spent two months at sea test-fishing for tuna northeast of New Zealand. The vessel (which is equipped with a power block) returned to Yokosuka on May 13, 1964, and reported very little success in its test-fishing experiment. The lack of success was attributed to unfamiliarity with the fishing grounds and to the lateness of the season. Fish schools located by that vessel by means of a fish-finder were at depths of 200-300 meters, so the vessel was not able to set its net on them. The vessel did not encounter any yellowfin or skipjack tuna.

The Japanese fishing company which operates the Kenyo Maru is reported to be planning on sending that vessel to the South Pacific again next year, only earlier in the season. (Shin Suisan Shim-bun Sokuho, May 7, 1964.)

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#### TUNA MOTHERSHIP DEPARTS FOR TAHITIAN WATERS:

The Japanese Nojima Maru (8,800 gross tons) tuna mothership fleet departed for the South Pacific waters off Tahiti on May 10, 1964, from Kobe. Although earlier reported to be encountering some difficulty in signing up catcher vessels, the fishing company operating that mothership succeeded in contracting for 65 catcher vessels (including 4 scout vessels) to deliver fish to its mothership. (Suisancho Nippo, May 9, 1964.)

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#### TUNA-VESSEL REFUELING AT SEA TO CONTINUE:

The Japan Federation of Tuna Fishermen's Associations (NIKKATSUREN) planned again to charter an oil tanker for refueling tuna vessels at sea, as it did in 1963. In addition to fuel, the tanker will carry fresh water and food for the tuna vessels receiving fuel.

## Japan (Contd.):

Later NIKKATSUREN chartered the 1,983-ton tanker Tofuku Maru to refuel tuna vessels at sea. The tanker was to have departed Yokohama for the eastern Pacific on May 13, 1964.

In 1963, NIKKATSUREN had chartered the 1,500-ton tanker Shimmei Maru. That tanker refueled 82 tuna long-line vessels at sea at a saving estimated to total three million yen (US\$8,333) a vessel. The savings resulted from elimination of running time to port to refuel and resultant increase in fishing time. (Suisan Keizai Shimbun, May 13, 1964, and other sources.)

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## EXPORTS OF TUNA

SPECIALTY PACKS, FY 1963:

Japanese tuna specialty packs exported in FY 1963 (April 1963-March 1964) totaled 438,875 cases, according to data compiled by the Japan Tuna Packers Association. This

Japanese Exports of Tuna Specialty Packs, FY 1963		
Product	FY 1963	FY 1962
	... (Actual Cases) ...	
<b>Tuna:</b>		
With vegetable . . . .	362, 673	328, 140
In jelly . . . . .	42, 736	95, 598
In tomato sauce . . . .	17, 976	14, 163
Stew . . . . .	4, 613	840
In specially seasoned sauce . . . . .	4, 600	-
In curry sauce . . . .	2, 911	3, 918
In soy sauce and oil . .	1, 640	1, 170
Sandwich spread . . . .	976	1, 203
With sweet & sour pork	750	315
Total . . . . .	438, 875	445, 347

represents a slight decrease from FY 1962, when exports totaled slightly over 445,000 cases. (Suisan Tsushin, April 17, 1964.)

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## TUNA DELEGATION TO

U. S. BEING CONSIDERED:

Japan is seriously considering sending to the United States a tuna delegation representing trading firms and packers to survey the United States canned tuna market. The idea of the survey originated with the trading firms, and the packers are reported to be very much in favor of it. An executive session of the Japanese Packers Association was scheduled for April 27, 1964, to discuss the matter.

Reportedly, Japan felt that the stagnant condition of the canned tuna sales market in the United States was not a temporary one and may have long-range repercussions. Because of this, Japan felt that it should begin to study and develop measures to cope with the problem. (Suisancho Nippo, April 22, 1964.)

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## CANNED TUNA MARKET

TRENDS, APRIL-MAY 1964:

Japan offered for sale between December 1963 and March 1964, a total of 670,000 cases of canned tuna in brine for export to the United States. Of that amount only about 400,000 cases were said to have been sold. The Japan Canned Tuna Sales Company had about 1.1 million cases of canned white meat tuna in brine in stock, as compared with 570,000 cases at the end of the December 1962-November 1963 business year.

The drop in sales of Japanese canned tuna in the United States was attributed mainly to the loss of the competitive position of Japanese brands, resulting from the large promotional sales conducted by United States tuna packers. Japanese tuna in brine was reported to be selling at prices higher than name-brand American products packed in oil.

Japanese trading firms submitted to the packers a request to grant a promotional allowance of US\$1.00 a case for solid white-meat tuna, 50 cents a case for solid light meat tuna, \$1.50 a case for chunk white meat tuna, and \$1.00 a case for chunk light meat tuna.

At a meeting held on April 27, 1964, the packers deliberated on the proposal submitted by the exporters. However, due to conflicting reports submitted by the exporters and by the Japan Export Trade Promotion Organization (JETRO) on the canned tuna market situation in the United States, the packers requested the attendance of a representative from the exporters' association. That representative stated to the packers (in reference to the JETRO report) that it is not possible at all to analyze market trends on the basis of one or two reports, that the American products are, in fact, actually selling at prices lower than the Japanese products as had been reported by his group, and that the packers should send a survey party to the United States to study the market situation firsthand.

## Japan (Contd.):

Earlier, the packers were greatly in favor of the proposal submitted by the exporters to send a delegation to the United States to study canned tuna market trends, but they later were indifferent to the idea, although a segment of the packers' group still strongly favored doing so.

The packers had not arrived at any definite conclusion concerning the exporters' proposal to reduce prices and grant promotional allowances. They clearly recognize the need for placing Japanese canned tuna in a competitive position with the American products, but claimed that the promotional allowance requested by the exporters is excessive. As a result of the slump in sales, the canned tuna sale that had been scheduled for April was postponed until mid-May. (Suisan Tsushin, April 24, 27, & 28; Suisancho Nippo, April 23, 25, & 30, 1964.)

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# TUNA LONG-LINE EXPLORATORY CRUISE AIDS UNITED STATES SHARK STUDY:

An observer from the United States Bureau of Commercial Fisheries boarded the Japanese research vessel Shoyo Maru at Panama on January 3, 1964, for a 2-months' cruise. The vessel was carrying out exploratory long-line fishing in the eastern tropical Pacific. From Panama, the vessel's cruise track ran to 10° S. latitude, 100° W. longitude. From there, 6 long-line stations were run to Manzanillo, Mexico, and from Mexico 8 stations were run to Honolulu, Hawaii.



The Japanese research vessel Shoyo Maru.

The Shoyo Maru, which does not carry commercial quantities of long-line gear, generally samples fringe areas not fished by Japanese commercial vessels. At the 14 stations between Panama and Hawaii, a total of 56 yellowfin tuna averaging 82 pounds each

were caught, along with 85 big-eyed tuna averaging 125 pounds each, and 98 spearfish averaging 72 pounds. Thirteen percent of the catch was damaged by shark bites and a total of 247 sharks representing 7 species were taken.

Frozen storage was provided on the Shoyo Maru so that 16 shark specimens could be preserved. On arrival at Honolulu, the shark specimens were shipped to California for taxonomic study in connection with work on a species list and key to all sharks found in the eastern Pacific.

Eyes of sharks, yellowfin, big-eyed, skipjack, little tuna, and frigate mackerel were preserved for a histological study of the retinas.

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# PRICES PAID FOR FIRST JAPANESE SALMON LANDINGS, MAY 1964:

On May 7, 1964, the first significant landing (over 2 metric tons) of salmon (mostly chums) caught by a gill-net vessel was reported at the Japanese port of Hanasaki, Hokkaido. The fresh whole salmon sold (for the domestic trade) at the following prices:

Species	Price	
	Yen/Kg.	Cents/Lb.
Chum (A quality)	398	50
" (B quality)	358	45
Pink (A quality)	230	29
" (B quality)	190	24

In comparison, a year earlier on the same day (when market was somewhat stabilized due to large landings), A-quality fresh round chum sold for 325 yen a kilogram (US\$0.41 a lb.) and A-quality fresh round pink salmon 212 yen a kilogram (\$0.267 a lb.). (Hokkai Suisan, May 11, 1964.)

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# SALMON PRICES NEGOTIATED WITH VESSEL OWNERS:

In April, the Japan Federation of Salmon Fishermen's Associations (NIKKEIREN) was negotiating 1964 salmon prices with the Japa-

Species	1964 Asking Price		1963 Price	
	Yen/Kg.	US\$/Lb.	Yen/Kg.	US\$/Lb.
Salmon:				
Red . . . .	215	27.1	203	25.6
Chum . . .	130	16.4	110	13.9
Pink . . .	105	13.2	88.5	11.2
Silver . . .	144	18.2	120	15.2
King . . .	144	18.2	120	15.2

## Japan (Contd.):

nese companies operating salmon mother-ships. NIKKEIREN planned to ask for a 10 percent increase in salmon prices as shown in table.

The mothership companies, however, were planning to ask for a reduction of 10 percent from last year's salmon prices. (Suisan Tsushin, April 22, 1964.)

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# SALMON FISHERY QUOTA ALLOTMENT AND FLEET COMPOSITION:

The 1964 allocation of the 55,000-metric-ton salmon catch quotas for Areas A (north of 45° N. latitude) and B (south of 45° N. latitude) in the North Pacific was announced by the Japanese Fisheries Agency on May 9, 1964:

Area	Fishery	Catch Quota	
		Metric Tons	Percent
A	Mothership-type fishery	44,665	81.21
	" Land-based gill-net fishery	10,335	18.79
	Total . . . . .	55,000	100.00
B	Land-based gill-net fishery	33,240	60.44
	" " long-line fishery	14,760	26.84
	" " " small-vessel fishery . . .	4,000	7.27
	" Japan Sea gill-net fishery	3,000	5.45
	Total . . . . .	55,000	100.00

The salmon mothership fleet for 1964 totals 11 motherships and 369 catcher vessels, the same as in 1963. The land-based gill-net fleet numbers 333 vessels. They consist of 293 vessels over 30 gross tons licensed by the Ministry of Agriculture and Forestry and 40 vessels over 5 tons but under 30 tons licensed by the prefectural government. The land-based long-line fleet consists of 369 vessels, 176 operating out of Japan proper and 193 based in Hokkaido. The small vessel salmon fleet consists of vessels under five gross tons and are estimated to total 1,200 vessels. Licenses are not required for their operation. The Japan Sea pink salmon gill-net fleet is restricted to 95 vessels in 1964. However, only 76 are reported to be actually engaged in fishing this year.

The salmon motherships were scheduled to depart for the fishing grounds on May 15 from Hokkaido ports. The fishery in Area B commenced on April 30 for vessels operating out of Japan proper and May 2 for vessels based in Hokkaido. The Japan Sea pink salmon

on fishery commenced in early spring. (Suis-ancho Nippo, May 1 & 11, 1964, and other sources.)

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# SALMON NEGOTIATION WITH U.S.S.R. CONCLUDED:

On April 22, 1964, Japan and the Soviet Union informally agreed on the 1964 North Pacific salmon catch quota of 110,000 metric tons for Japan, the quota to be equally divided between Area A and Area B. This is the lowest catch quota established in eight years. Formal ratification of the agreement was scheduled for April 27.

On April 18, Japan and the Soviet Union reached an informal agreement on the following points:

1. Japan to autonomously regulate the catch of salmon in Area B according to type of fishery (e.g., long-line, gill-net) and to notify the Soviet Union of the estimated salmon catch of Japanese vessels operating in Area B.

2. Japan to voluntarily regulate the catch of red salmon in Area A, restricting the total catch to 7,750,000 fish. Of this quantity, Japan to limit the catch in the area west of 165° E. longitude and north of 48° N. latitude to 2.5 million fish.

3. Japan to operate two salmon motherships in the adjustment area north of the Komandorskie Islands, as in 1963.

4. The Soviet Union to permit Japanese scientists to visit the Okhotsk Sea area and the northern West Kamchatka area. (Rafu Shimpo, April 25; Suisan Keizai Shimbun, April 21, 1964.)

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# JAPANESE VIEW ON CANADIAN CANNED PINK SALMON MARKET TRENDS:

According to information from sources connected with Japanese trading firms, Canadian holdings of canned pink salmon have been reduced from 540,000 cases carried over from 1963 to 362,500 cases as of April 30, 1964. The reduction of inventory was attributed to improved market conditions in Canada. The quality of the canned pink salmon stocks in Canada at that time was said to be suitable for either domestic consumption or for export.

## Japan (Contd.):

The supply was expected to be exhausted by the end of June.

The increased production of canned pink salmon in Canada during the past three years is reported to have resulted in the development of a buyer's market. For 1964, however,



Japanese sources foresee a decline in Canadian pink salmon production, which may well lead to a seller's market. Therefore, Japanese traders, who foresee a good pink salmon export market this year, are reported to be hopeful of raising the export price of the 1964 pack substantially above the existing Japan f.o.b. price of \$10.30 a case. (Suisancho Nippo, May 4, 1964.

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#### BOTTOMFISH MOTHERSHIP OPERATIONS IN BERING SEA:

The Japanese mothership Soyo Maru (11,192 gross tons), accompanied by 28 trawlers, left Yokohama May 10, 1964, for the Eastern Bering Sea. The mothership Itsukushima Maru (5,871 gross tons), accompanied by 12 trawlers and six long-line vessels, was scheduled to leave Hakodate May 19. Three Japanese mothership fleets were on their way to the Eastern Bering Sea fishing grounds in early May: the stern trawler Taiyo Maru No. 82 (2,890 gross tons), accompanied by one small side trawler, left Hakodate May 1; the Seifu Maru (8,269 gross tons) fleet (17 trawlers and 11 long-liners) left Yokohama on May 2; and the Shikishima Maru (10,144 gross tons) fleet (24 trawlers) left Hakodate May 3.

The 700-ton mothership Fuji Maru specially chartered to fish for halibut in Area 3B North Triangle was scheduled to return to Japan in late May. The mothership's five long-line vessels are to be assigned to the Seifu Maru fleet. (Suisan Tsushin, May 4, 7, and 11, 1964.)

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#### BERING SEA VESSEL DEPARTURES:

The two 3,500-ton stern trawlers under construction for a Japanese fishing company were scheduled to be dispatched to the eastern Bering Sea in mid-July and late August. The departure of that company's Chichibu Maru No. 2 (1,693 gross tons) fleet, originally scheduled for early May, was postponed until late June or early July.

Other Japanese motherships scheduled to depart for the eastern Bering Sea in May were: the Seifu Maru (8,269 gross tons) accompanied by 28 catcher vessels, departing Japan on May 2, and the Itsukushima Maru (5,871 gross tons) accompanied by 9 trawlers and 9 long-liners, departing Hakodate, Japan, about May 15. (Suisan Tsushin, April 17 and 18, 1964.)

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#### SHRIMP FISHERY IN BERING SEA:

A large Japanese fishing company's shrimp factoryship Chichibu Maru (7,420 gross tons) has been fishing for shrimp in the Eastern Bering Sea with 12 trawlers. The factoryship had processed about 4,500 metric tons of shrimp as of early May 1964. Due to engine trouble, she was expected to return to Japan around May 20 for repairs, after which she will again depart for the Bering Sea shrimp grounds in August. (Suisancho Nippo, May 7, 1964.)

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#### JAPANESE ATLANTIC TRAWL FLEET:

By December 1964, 18 newly constructed Japanese trawlers are expected to be placed in operation in the Atlantic Ocean. This will enlarge the size of the Japanese Atlantic trawl fleet from 35 trawlers in operation as of March 31, 1964, to 53 vessels.

Of the 18 trawlers, 13 are vessels newly licensed by the Fisheries Agency in November 1963 to engage in the eastern Atlantic Ocean trawl fishery. Seven of the 13 trawlers (one 190-ton, five 299-ton, and one 2,500-ton vessels) were scheduled to be completed by June 1964, and 6 (one 290-ton, one 1,500-ton, one 2,530-ton, one 2,800-ton, and two 3,000-ton vessels) by October 1964.

The remaining 5 trawlers are those previously licensed for construction by the Agency. They include one 1,500-ton, two 2,800-ton, and

## Japan (Contd.):

two 3,400-ton trawlers. They were expected to be completed some time between May-December 1964.

In view of the high cost of constructing the trawlers, which may require 5 years to write off, some circles in the Japanese fishery are said to be entertaining doubts that the trawlers entering the Atlantic fishery can operate profitably. They hold the view that vessel owners entering the trawl fishery must bear in mind that, despite reports of good prospects of developing markets for trawl-caught fish, catches in the principal trawling grounds off Las Palmas are declining and that the composition of the catches has changed. (Suisan-cho Nippo, May 4, 1964.)

Editor's note: In November 1963, the following 13 classes of trawlers were licensed for operation off West Africa: 3,500-, 3,000-, 2,800-, 2,500-, 2,000-, 1,500-, and 500-ton--one each; 299-tons--six. Thus, 2 of the 13 trawlers under construction during mid-year 1964 (one of 2,500 tons and the 190-ton trawler) do not "fit" the licensing requirements.

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#### JAPAN MAY JOIN INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES:

The Japanese Government has for some time been studying the possibility of becoming a member of the International Commission for the Northwest Atlantic Fisheries. She was reported to be planning on sending as observers to the Commission's annual meeting (scheduled for Hamburg, Germany, June 1, 1964) the former Fisheries Agency investigation official; the First Secretary, Japanese Embassy, London; the chief, trawl fishing department, of one of Japan's largest fishing companies; and one other person.

This move was being interpreted in Japan as a preliminary but positive step taken by the Japanese Government preparatory to joining the Commission. As of May 1964, trawlers licensed by the Japanese Government to operate in the North Atlantic were the Aoi Maru No. 2 (1,130 gross tons) and the Tenyo Maru No. 3 (3,700 gross tons). The latter trawler is fishing with two 300-ton trawlers (Chuyo Maru and Eiyo Maru). In addition, several large Japanese companies are reported as planning to operate large stern

trawlers in the North Atlantic in the near future. (Minato Shimbun, May 5; Nihon Keizai Shimbun, May 1, 1964.)

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#### FREEZERSHIP DEPARTS FOR LAS PALMAS TO PROCESS BOTTOMFISH:

The Japanese freezership Hoyo Maru (formerly the Renshin Maru 6,800 gross tons) was scheduled to depart Shimonoseki, Japan, on May 15, 1964, for Las Palmas, Canary Islands. The vessel, formerly operated by a Japanese fishing firm under the name of Fuji Maru, was remodeled and put to a test run off Japan early this year by another Japanese fishing firm.



Japanese mothership Hoyo Maru (formerly the Renshin Maru).

The Hoyo Maru was expected to arrive at Las Palmas in late June, where it will be used for about one year to freeze and process bottomfish, such as sea bream, squid, and octopus, to be purchased from about 40 local fishing vessels under an agreement concluded this past April between the Japanese firm operating the vessel and a Spanish firm. The freezership is expected to process in one year a total of 10,000 metric tons of fish, which will be exported to such countries as Spain, Italy, and Denmark, as well as shipped back to Japan.

A similar arrangement was concluded in the summer of 1963 between another Japanese firm and another Spanish fishing firm located in Las Palmas. That same Japanese firm has a five-year contract to purchase annually from the Spanish firm 6,000 metric tons of squid, sea bream, and octopus. (Suisan Tsushin, May 2, 1964, and other sources.)

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#### LARGE STERN TRAWLERS COMPLETED:

Two stern trawlers--Akebono Maru Nos. 71 & 72 (each of 3,500 gross tons)--under construction at Hakodate were expected to be completed in June and July, respectively, one



## Japan (Contd.):

month earlier than originally scheduled. Upon completion, they were to be dispatched to the North Pacific and Bering Sea. One large Japanese fishery firm built both vessels. The Akebono Maru No. 71 replaces the 1,500-ton stern trawler Akebono Maru No. 52 which has been operating in the eastern Bering Sea. The Akebono Maru No. 72 is expected to replace the 1,500-ton stern trawler Akebono Maru No. 51, operating in the Gulf of Alaska.



Japanese stern-trawler Akebono Maru No. 51.

Another firm's new stern trawler, Daishin Maru No. 15 (1,500 gross tons), was scheduled for launching on May 8 at the Osaka Shipyards, with final completion in late June. That stern trawler was scheduled to be sent to the Gulf of Alaska on her maiden trip. (Suisan-cho Nippo, May 2 and 12, 1964.)

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#### STERN TRAWLER COMPLETED FOR BERING SEA OPERATIONS:

A large Japanese fishing company accepted delivery of its new 2,800-ton stern trawler Taiyo Maru No. 82 on April 15, 1964. Built at a total cost of 800 million yen (US\$2.2 million), the vessel has the following specifications: length--82 meters (269 feet); beam--14 meters (50 feet); depth--9.2 meters (30 feet); engine--3,150 hp.; speed--12 knots; freezing capacity--45 metric tons per day.

The new stern trawler was to depart for the Eastern Bering Sea on April 24, 1964, accompanied by the 360-ton trawler Taiyo Maru No. 16. (Nihon Shimbun, April 22; Minato Shimbun, April 23, 1964.)

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#### TWO NEW STERN TRAWLERS SENT TO WEST AFRICAN FISHING GROUNDS:

Two new small stern trawlers were scheduled to depart from Japan for fishing grounds off West Africa on May 1, 1964. The new vessels are the 314-ton sister trawlers Kyoshin Maru Nos. 51 and 52. (Nihon Suisan Shimbun, April 22, 1964.)

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#### LARGE STERN TRAWLER COMPLETED FOR RUMANIA:

Construction of the second of two large stern trawlers ordered by Rumania was completed at a Japanese shipyard in mid-April 1964. Called the Galati, the trawler (3,631 gross tons) carries two 20-ton portable vessels, and is equipped with a fish-meal processing unit and fish-filleting equipment. Total construction cost was 1,008.0 million yen (US\$2.8 million). (Minato Shimbun, April 23, 1964.)

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#### VESSEL CONSTRUCTION, MAY 4, 1964:

On May 4, 1964, the Japanese Fisheries Agency issued permits for the construction of 22 fishing vessels: 9 wooden vessels (totaling 160 gross tons) and 13 steel vessels (totaling 2,394 gross tons). Included were permits for 9 steel tuna vessels: two 111-ton, two 192-ton, four 253-ton, and one 375-ton long-liners. (Suisan Keizai Shimbun, May 8, 1964.)

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#### NATIONAL PROGRAM TO PROMOTE FROZEN FISH SALES ESTABLISHED:

A meeting to formalize plans for promoting the consumption of frozen fishery products in Japan was scheduled for April 23, 1964, by the Director of the Japanese Fisheries Agency with the heads of six major Japanese fishing firms and the Japan National Federation of Fishermen's Cooperative Associations. Plans were that the program will be funded with a total capital of 40 million yen (US\$111,000), one-half to be financed by the industry and one-half to be subsidized by the Government. Government funds for the program have already been appropriated in the fiscal year 1964 (April 1964-March 1965) budget.

The proposed plans of the frozen fish promotion are:

Japan (Contd.):

1. Purpose: The purpose of the program is to promote the sale of good-quality frozen fishery products to consumers at the retail level in an effort to create greater demands for those products. The mass media shall be utilized for promotional purposes.

2. Methods of Promotion and Sale: Advertising media, such as radio, television, and newspapers, as well as food exhibits, shall be utilized to introduce good methods of preparing frozen fishery products. Over 20 frozen fish retail stores shall be established in Tokyo to sell frozen fish products of improved quality.

3. Management Organization: The management organization, to be tentatively named the Frozen Fish Products Association, shall be formed by the organizations connected with the frozen fish industry. They shall include the Japan National Federation of Fishermen's Cooperative Associations (ZENGYOREN) and six fishery firms. The Association shall be chartered as a corporation qualifying for government subsidy and shall conduct the following activities:

(a) Publicity by means of advertising in newspapers, magazines, radio, and television; poster and pamphlet distribution, preparation and presentation of film slides; and presentation of food exhibits and cooking classes. (b) Quality improvement program to improve the image of frozen fish. For that purpose, quality and size standards, and a uniform labeling system for frozen products shall be established.

The newly formed Frozen Fish Products Association shall have a staff of 1 managing director, 1 executive director, 7 directors, 2 secretaries, and 3 staff personnel.

4. Frozen Fish Retail Stores: Frozen fish retail stores shall be established to acquaint the consumer with the advantages of buying and using frozen fish as follows:

(a) Member firms of the Association shall establish in Tokyo at least 20 retail stores displaying frozen fishery products. They shall provide guidance to store operators on how to stock and sell frozen fish products. (b) The selection of sites for the frozen fish stores, prod-

uct quality, price adjustments, and other matters requiring adjustment among the shop operators shall be handled by the existing Frozen Foods Promotion Association. (c) In view of the seasonal nature of fish supply, turnover of products, and space consideration for display cases, about 20 varieties of frozen fish products shall be placed on sale. All products shall bear standard labels showing that they conform to prescribed quality standards. Retail prices shall be fixed for all specified products and retailers shall conform to those prices as much as possible.

5. Frozen Foods Promotion Association: The existing organization (a corporation formed by four major frozen food producers) shall be expanded by soliciting for membership other producers in related industries, such as the frozen fish, electric appliance, and the food wrapper manufacturing industries.

The Association shall perform adjustment services (on matters related to selection of shop locations, quality and price determination for products) and assist in obtaining business capital. The Association shall have on its office staff 1 full-time worker and 3 members associated with the Frozen Fish Products Association. (Suisan Keizai Shimbun, April 17 & 22, 1964.)

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#### FISH SAUSAGE PRODUCTION, FISCAL YEAR 1963:

Data compiled by the Japan Fish Sausage Association show that a total of 130,206 metric tons of fish sausage and fish ham were produced in Fiscal Year 1963 (April 1963-March 1964). This represents a 14-percent increase over Fiscal Year 1962, when production totaled 114,125 metric tons. Production of fish sausage totaled 98,444 tons, representing a 28-percent increase over 1962 production of 76,832 tons, and production of fish ham sausage totaled 31,762 tons, showing a 15-percent decrease from the 37,293 tons produced in 1962. The increase in fish sausage production is attributed to improved methods of processing and marketing, the low price maintained for that product compared with the rising prices of beef and pork sausages and other food products, and increased consumption of fish sausage in farming and fishing communities. (Suisancho Nippo, May 1, 1964.)

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Japan (Contd.):

#### SOUTH AFRICAN FISH MEAL TO BE IMPORTED BY JAPAN:

The Japanese Fisheries Agency, after studying the request submitted by the Live-stock Bureau, is reported to have approved the importation of 25,000 metric tons of South African fish meal in fiscal year 1964 (April 1964-March 1965). The South African fish meal is reported to have been contracted at a price of 54,142 yen (US\$150) a metric ton. (Suisan Keizai Shimbun, May 13, 1964.)

Editor's note: The press report did not state whether the price is f.o.b. or c.i.f.

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#### US\$1 MILLION FOR SOUTH KOREAN IMPORTS ALLOTTED BY JAPAN:

The Japanese Ministry of International Trade and Industry (MITI) was expected to formally approve a foreign fund allocation of US\$1 million for the importation of South Korean fishery products in fiscal year 1964 (April 1964-March 1965). Japanese producers and exporters had requested an allocation of US\$1.8 million and the MITI had recommended US\$1.3 million, the same as in fiscal year 1963. However, the Fisheries Agency had held firmly to an allocation of US\$1 million on grounds that it would not yet be advisable to liberalize imports from Korea since the Japan-Republic of Korea fisheries negotiation had not yet been concluded. The Agency also held that the 1963 allotment included a special appropriation of US\$300,000, and it would not at all be possible to predict whether a special need such as that which arose in 1963 would arise again in 1964. (Suisancho Nippo, May 7, 1964.)

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#### JAPANESE-CANADIAN TALKS ON FISHING LIMITS PLANNED:

A Japanese delegation was scheduled to arrive in Canada May 1, 1964, to conduct preliminary discussions with Canadian Government officials regarding Canada's proposal to enact unilaterally a 12-mile fishing limit based on the straight base-line concept. The Japanese delegation was said to consist of an official from the Japanese Fisheries Agency, an industry representative, and a counselor from the Japanese Embassy in Ottawa. (Nihon Suisan Shimbun, April 24, 1964.)

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#### KELP FISHERY AGREEMENT WITH SOVIET UNION:

An agreement was formally signed in Moscow on April 29, 1964, between Japan and the Soviet Union to extend for a one-year period the Japan-U.S.S.R. private kelp fishery agreement originally concluded on June 10, 1963. Representing Japan at the kelp negotiation was the President of the Japan Fisheries Society. The U.S.S.R. was represented by the Soviet Fisheries Minister.

The kelp agreement, concluded on a private basis between the Japan Fisheries Society and the Soviet State Fisheries Commission, permits up to 300 Japanese fishing boats to harvest kelp in approximately a 4.5-square-mile area off the Shigunarinui Island in the Nemuro Strait, northeast of Hokkaido. As in 1963, the Japan Fisheries Society will pay the Soviet Union a kelp harvesting fee of 12,000 yen (US\$33.34) per boat. Opening date for the kelp harvesting season was advanced from June 10 to June 1. Closing date is September 30, as in 1963. The 1964 kelp production is expected to total about 1,800 metric tons. The 1963 harvest totaled 1,200 tons. (Suisan Keizai Shimbun, May 1; Suisancho Nippo, April 30, 1964.)

日本

#### **Mauritania**

#### SIGNS 50-YEAR FISHERIES TREATY WITH SPAIN:

Three treaties, one of which is on the fisheries, were signed by Mauritania and Spain at the capital city of Nouakchott on February 14, 1964. In the fisheries treaty, Spain agrees to construct and operate fish-processing plants at Port-Etienne in Mauritania, in return for the right for Spanish fishermen to fish Mauritanian waters on the same basis as that country's nationals.

The 50-year fisheries treaty is potentially of great importance to the development of Mauritania's major natural resources. It attempts to regulate the difficulties that have arisen between Spain and Mauritania since the latter's independence over the traditional use of Mauritanian territorial waters by Canary Islands-based Spanish fishermen. It gives Spain the right to fish in Mauritanian waters under the same conditions as Mauritanian nationals, in return for sizable Spanish investments in fish-processing facilities at Port-Etienne, and the right of free repatriation of profits from such industries.

## Mauritania (Contd.):

In the treaty, Spain specifically guarantees: (1) to build and operate a salting and drying plant within 18 months with an annual capacity of 6,000 metric tons; and within 24 months, a cannery with an annual capacity of 3,000 tons; and a fish-meal factory capable of treating 100 tons of fresh fish daily; (2) to document 20 to 50 Spanish fishing vessels under Mauritanian registry, subject to Mauritanian laws; (3) for Spanish vessels fishing Mauritanian waters, to pay an annual royalty of US\$10 a gross ton; and (4) train Mauritanian commercial fishermen in Spanish schools and as crewmen aboard Spanish vessels fishing Mauritanian waters.

In addition to permitting the use of Mauritanian waters and repatriation of profits, Mauritania agrees to: (1) grant Spanish fisheries enterprises most-favored-nation administrative, customs, and tax treatment; (2) make available the necessary construction sites for the projected industrial establishments; and (3) reserve to Spanish fishermen the necessary storage space in the projected refrigeration facilities at Port-Etienne for the fish used in 15 days' operations in the canning and fish-meal plants. (United States Embassy, Nouakchott, March 30, 1964.)

Note: See Commercial Fisheries Review, October 1963 p. 60.



## Mexico

### POSSIBLE EFFECTS OF SHRIMP VESSEL TIE-UP AT MAZATLAN:

The decision of shrimp vessel owners in Mazatlan, Mexico, on May 6, 1964, to halt operations of 100 privately owned vessels was believed would result in greatly reduced shrimp catches during the final 2 months of the 1964 fishing season. The shutdown was caused by steadily worsening catches that made fishing unprofitable.

Mazatlan is the principal shrimp port of Mexico with 270 to 300 vessels of the approximately 600 operating out of Pacific Coast ports. With a large segment of the Mazatlan shrimp fleet tied up, including many of the best vessels, several packing plants closed down. Although vessels belonging to the cooperatives and some privately owned vessels continued to fish out of Mazatlan for those plants that were still operating, the partial

tie-up coupled with generally poor fishing was believed would result in very small shrimp landings. That could reduce shrimp shipments to the United States for the remainder of the season to July 15, 1964. The atmosphere for negotiating next year's contract between vessel owners and fishermen may also be impaired.

The existing contract between vessel owners and the crew members who belong to the several cooperatives was based on the good fishing and high prices that prevailed during the previous season (1962/63). It called for the crew to receive 45 percent of the gross catch and required the crew to pay only for provisions, with the owner paying all other expenses. When the price of shrimp dropped to pre-1963 prices and catches slumped while operating costs remained unchanged, returns dropped below the break-even point, according to the vessel owners. Some of the cooperatives were also reported to be overextended and in a poor credit position. Tension was reported between the cooperatives and vessel owners all season as the fishermen scouted all available shrimp grounds from south of San Blas, Nayarit, to the outer coast of Baja California, and fishermen from Topolobampo in northern Sinaloa reportedly penetrated into the Mazatlan fleet's traditional areas.

Because of this year's poor results, a number of Mexican shrimp vessels have left to work new grounds off French Guiana. Other owners are ready to send their vessels to French Guiana, and reportedly over 500 fishermen including highline skippers have applied to go with them. The 12 vessels being built at Mazatlan for export to Kuwait will require 36 officers and crewmen, and the shipyard building the vessels reports "hundreds" of applications. A feeling of pessimism pervaded the Mazatlan shrimp fishery. (United States Embassy, Mexico, May 18, 1964.)



## Morocco

### FISHERIES TRENDS, FIRST QUARTER 1964:

The first quarter is traditionally the slack season for the Moroccan fishing fleet. This year bad weather prevented the start of the sardine fishing season at Safi at the usual time, and it was not expected that the catch would reach important proportions until the end of April. Farther south at Agadir, the

## Morocco (Contd.):

local vessels with limited range had still not found sardines in commercially important quantities by mid-April 1964.

The past two years have seen strenuous objections by French fishermen against the arrival of frozen Moroccan sardines on the French market during the peak of the French fishing season. As a result, the French and Moroccan Governments have agreed to suspend exports of Moroccan frozen sardines to France during the summer. The late start in the Moroccan sardine fishery may, therefore, result in important reductions in sales.

The possibility of expanding the Moroccan tuna catch has continued to attract attention. A team of consultants from the United States Agency for International Development had previously recommended a careful exploration of offshore tuna fishing grounds using a modern fishing vessel. For various financial and technical reasons, United States vessels were not suitable for the project, so a French vessel has been chartered to carry out a one-year study of the tuna potential off Morocco. (United States Embassy, Rabat, April 24, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 65.

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## TANGIER FISH MARKET SALES, 1963:

In 1963, the Tangier Fish Mart received 1,000 tons of tuna (includes a small quantity of bonito, mackerel, and swordfish) from the fishery in the Cape Spartel region. Of that total, 738 tons were immediately sold while 262 tons were exported.

The Tangier Fish Mart in 1963 also received 2,378 tons of fish other than tuna (1,468 tons from the inshore net and small-boat fishery and 910 tons from the coastal fishery) and 71 tons of shellfish. Most of those receipts were immediately sold and only a small quantity was used for canning or freezing.

The Tangier Fish Mart makes no distinction between fish landed at Tangier and fish trucked in from Alhoceima or Larache. (United States Embassy, Rabat, April 3, 1964.)



## Netherlands

## MARINE OIL INDUSTRY TRENDS, 1963, AND ANTARCTIC WHALING RESULTS, 1963/64 SEASON:

Marine Oil Industry Trends, 1963: In calendar year 1963, the Netherlands imported 95,500 metric tons of fish oil, including 26,456 tons of whale oil. Netherlands use of fish oil in edible products during 1963 amounted to about 82,500 tons compared with similar use of about 47,500 tons of soybean oil, 43,300 tons of palm oil, and 30,000 tons of coconut oil. (United States Embassy, The Hague, April 27, 1964.)

Antarctic Whaling Results, 1963/64 Season: The Netherlands Whaling Company announced that the Dutch whaling expedition caught 343 international blue-whale units during the 1963/64 Antarctic whaling season, which was 257 units short of its quota of 600 units per-

Netherlands Whaling Company Production in Antarctic, 1961/62-1963/64			
Product	Season		
	1/1963/64	1962/63	1961/62
	(Metric Tons) . . . . .		
Whale oil . . . . .	8,026	10,527	12,155
Sperm oil . . . . .	2,578	2,927	2,918
Meat meal . . . . .	978	1,275	1,726
Frozen meat . . . . .	1,194	1,108	1,582
Meat for Japanese refrigerator ship . . . . .	6,045	7,284	7,932
1/Preliminary.			

mitted under the International Whaling Agreement. (United States Consulate, Amsterdam, April 27, 1964.)

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## NEW TRAWLER "TINIE CORNELIA":

The dual-purpose trawler Tinie Cornelia was recently completed by a Dutch shipyard in Breskens. The vessel can be used as a stern trawler, or as a double-rig beam trawler. When twin-beam trawling, the two derricks on the vessel are topped up and the warps rove through the sheaves on each end. When stern trawling with a standard-type trawl, however, the derricks are lowered on to the strong back aft and the sheaves are used as towing blocks.

The derricks have been arranged in such a way that the risk of capsizing should the trawl come fast is minimized.

The principal dimensions of the Tinie Cornelia are: length overall 21.2 meters (69.5

## Netherlands (Contd.):

feet), breadth 5.6 meters (18.4 feet), and depth 2.6 meters (8.5 feet). The vessel's refrigerated fishroom has a capacity of 47 cubic meters (61.47 cubic yards), and accommodations are provided for a crew of 7.

The vessel is driven by a 380-horsepower Diesel engine, and is equipped with electro-hydraulic steering gear. The winch is situated well forward beneath the wheelhouse, and can be controlled from the bridge. Electronic fish-finding and navigational equipment are also provided. (World Fishing, April 1964.)



## Norway

EXPORTS OF CANNED FISH,  
JANUARY 1-FEBRUARY 22, 1964:

Norway's total exports of canned fish in January 1-February 22, 1964, were up 12.5 percent from those in the same period of 1963. Shipments of canned brisling were up 15.5 percent and of canned small sild up 12.8 percent. Other Norwegian canned fishery products were also exported in greater quantity in early 1964.

Norwegian Exports of Canned Fish, January 1-February 22, 1963-1964		
Product	Year	
	1/ 1964	1963
	... (Metric Tons) ...	
Brisling . . . . .	948	821
Small sild . . . . .	1,955	1,733
Kipperd herring . . . . .	470	438
Soft herring roe . . . . .	38	14
Sild delicatessen . . . . .	72	65
Other canned fish . . . . .	282	320
Shellfish . . . . .	260	188
Total . . . . .	4,025	3,579
1/Preliminary.		

The Norwegian winter herring fishery in 1964 yielded a better catch than in the previous year and by March 14, 1964, the Norwegian kippered herring canned pack amounted to 206,524 standard cases compared with only 70,862 cases in the same period of 1963.

Norwegian production of canned soft herring roe also increased considerably in early 1964 and by mid-March amounted to 16,078 cases of  $\frac{1}{2}$  ovals and 28,276 cases of  $\frac{1}{4}$  oblong cans as compared to 5,757 cases of  $\frac{1}{2}$  oval and 15,968 cases of  $\frac{1}{4}$  oblongs in the same pe-

riod of the previous year. (Norwegian Canners Export Journal, April 1964.)

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NORWEGIAN STERN-FISHING  
FACTORY TRAWLER LANDS FROZEN  
PROCESSED CATCH IN ENGLAND:

The Norwegian factory trawler Longva completed its fourth fishing trip when it arrived in Grimsby, England, March 31, 1964, with a capacity load of 400 tons of frozen fillets (mainly skin-on cod fillets in 10-pound blocks). The owners of the 1,092-gross-ton vessel have contracted to deliver the vessel's catch in 1964 to a British distributor of frozen fishery products. The 400 tons of fillets delivered in March were processed aboard the Longva from a catch of about 14,000 kits (1,960,000 pounds) taken during a 3-months trip in early 1964. (The average catch by a conventional British trawler during a typical 22-day trip is said to amount to about 2,000 kits, or only 280,000 pounds.)

With an overall length of 208 feet, the Longva is only about 30 feet longer than the average British deep-water trawler. The Norwegian vessel is considerably shorter than British factoryships and freezer-trawlers. The Longva has an extremely compact design, and additional space was saved by not installing a fish meal plant. Some waste products are frozen on the vessel for animal food, but of-fal is generally discharged into the sea.

The Captain of the Longva said the vessel's operations in early 1964 had included 2 weeks of fishing off the west coast of Greenland where the temperature was below -25° C. (-13° F.). The Longva can operate in extreme weather conditions because all fish handling is done below deck. When the cod end approaches the vessel during net hauling, it is taken up until suspended from the rear bipod mast. A large steel hatch door then opens beneath it, giving direct access to the rear of the fish-processing factory below the fishing deck. During the brief period the hatch is open, the cod end is opened and the catch--about three tons, on average--is discharged directly into pounds below deck. In the air-conditioned and heated fish factory, fish can be fully processed and delivered to cold storage within two hours after landing. Fish processing equipment on the vessel includes heading, filleting, and skinning machines which can be geared to process up to 20 tons of fillets a day.

## Norway (Contd.):

The Longva was built in late 1962 at Aalesund, Norway. (Fish Trades Gazette, April 11, 1964.)

Note: See Commercial Fisheries Review, April 1963 p. 66.

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## SUPPLY AND DISPOSITION OF MARINE OILS, 1963 WITH COMPARISONS:

In 1963, Norwegian production of marine oils (table 1) was 34 percent below that in the previous year due to a sharp decline in the yield from the 1962/63 whaling season in the Antarctic. Norwegian production of marine oils in 1964 was expected to continue at about the same level as in 1963.

Item	Forecast 1964	1/1963	2/1962
	..... (Metric Tons) .....		
Cold-cleared cod-liver oil . . . . .	10,000	4,100	5,500
Other fish-liver oils . . . . .	6,100	1,000	1,000
Herring oil . . . . .	60,000	60,000	61,000
Total fish and fish-liver oils	70,000	70,200	67,500
Seal oil . . . . .	2,500	2,000	2,800
Sperm oil:			
Antarctic . . . . .	8,500	7,378	12,020
Shore stations (Norway) . . . . .	800	916	687
Total sperm oil . . . . .	9,300	8,294	12,707
Whale oil:			
Antarctic . . . . .	34,000	31,423	85,015
Shore stations (Norway) . . . . .	500	209	847
Total whale oil . . . . .	34,500	31,632	85,862
Total marine oils . . . . .	116,300	112,126	168,869
1/Preliminary.			
2/Revised.			

The decline in Norwegian whale oil production in 1963 was only partly offset by heavier imports (tables 2 and 4). As a result, the Norwegian supply of crude whale and herring oil during 1963 was down 10 percent from the previous year, even though there were substantial stocks on hand January 1, 1963.

Norwegian exports of unrefined marine-animal oils (table 5) were down sharply in 1963 due mainly to smaller shipments of whale oil. The decline affected all the important unrefined marine oils exported by Norway except fish-liver oil. (In 1963, the leading buyers of Norwegian fish liver oil—other than medicinal cod-liver oil—were Czechoslovakia with 2,993 metric tons, West Germany with 1,945 tons, Sweden with 1,837 tons, Italy with 1,830 tons, and Denmark with

Item	Forecast 1964	1/1963	2/1962	1961
	..... (Metric Tons) .....			
Supply:				
Stocks, January 1 . . . . .	60,129	71,336	54,163	67,929
Production:				
Whale oil . . . . .	34,224	31,632	85,864	114,715
Herring oil . . . . .	60,000	60,000	61,000	59,000
Total production . . . . .	94,224	91,632	146,864	173,715
Imports:				
Whale oil . . . . .	-	11,715	1,674	79
Herring oil . . . . .	-	53,278	51,858	33,677
Total imports . . . . .	-	64,993	53,532	33,756
Total supply . . . . .	-	227,961	254,559	275,400
Disposition:				
Exports:				
Whale oil . . . . .	-	25,631	65,948	67,656
Herring oil . . . . .	-	98	125	398
Total exports . . . . .	-	25,729	66,073	68,054
Processed by hardening industry <sup>2</sup> . . . . .	-	142,103	117,150	153,183
Stocks, December 31 . . . . .	-	60,129	71,336	54,163
1/Preliminary.				
2/Revised.				
3/Data computed by deducting year-end stocks and exports from total supply; the export figures are complete but the year-end stocks may include oil not included in the reported supply.				

Item	1/1963	2/1962	1961
	..... (Metric Tons) .....		
Supply:			
Stocks, January 1 . . . . .	8,230	7,803	13,325
Production . . . . .	136,536	113,179	105,968
Imports:			
Edible . . . . .	2,012	1,125	372
Inedible . . . . .	-	47	13
Total imports . . . . .	2,012	1,172	385
Total supply . . . . .	146,778	122,154	119,678
Disposition:			
Exports:			
Edible . . . . .	59,982	40,922	45,396
Inedible . . . . .	27,058	20,902	10,479
Total exports . . . . .	87,040	61,824	55,875
Domestic disappearance <sup>3</sup> . . . . .	52,000	52,100	56,000
Stocks, December 31 . . . . .	7,738	8,230	7,803
1/Preliminary.			
2/Revised.			
3/The main consumer is the margarine industry; estimated consumption outside the margarine industry is only about 1,200 metric tons.			

1,253 tons. Norwegian exports of medicinal cod-liver oil in 1963 amounted to 2,158 tons and the United States was the leading buyer with 500 tons.)

In 1963, Norwegian production of hardened fats and oils from fish and marine-animal oils (table 3) was up considerably from the previous year. Exports absorbed the increase,

## Norway (Contd.):

Table 4 - Norwegian Imports of Selected Marine Oils, 1963			
Commodity and Country of Origin	Value		
	Metric Tons	Kr. 1,000	US\$1,000
<b>Whale Oil, Crude:</b>			
Netherlands . . . . .	1,988	1,973	276
United Kingdom . . . . .	2,031	2,874	402
Iceland . . . . .	1,046	1,344	188
Japan . . . . .	6,649	9,346	1,307
Other countries . . . . .	-	-	-
<b>Total . . . . .</b>	<b>11,714</b>	<b>15,537</b>	<b>2,173</b>
<b>Sperm and Bottlenose Oil, Crude:</b>			
Denmark . . . . .	556	1,014	142
Australia . . . . .	464	849	119
<b>Total . . . . .</b>	<b>1,020</b>	<b>1,863</b>	<b>251</b>
<b>Herring Oil, Crude:</b>			
Iceland . . . . .	16,590	13,508	1,889
West Germany . . . . .	15,265	14,784	2,068
United States . . . . .	8,186	8,059	1,127
Peru . . . . .	6,505	5,120	716
Other countries . . . . .	6,732	11,289	1,579
<b>Total . . . . .</b>	<b>53,278</b>	<b>52,760</b>	<b>7,379</b>
<b>Cod-Liver Oil:</b>			
Total all countries . . . . .	1,011	1,312	183
<b>Industrial and Mixed Fish-Liver Oils:</b>			
Iceland . . . . .	3,233	3,905	546
Other countries . . . . .	158	153	21
<b>Total . . . . .</b>	<b>3,391</b>	<b>4,058</b>	<b>567</b>
<b>Residual Fish-Liver Oils:</b>			
Sweden . . . . .	867	472	66
West Germany . . . . .	2,357	1,478	207
Other countries . . . . .	148	75	10
<b>Total . . . . .</b>	<b>3,372</b>	<b>2,025</b>	<b>283</b>
<b>Other Crude or Refined Fats and Oils from Fish and Marine Animals:</b>			
West Germany . . . . .	1,570	1,683	235
Peru . . . . .	1,831	1,073	150
Other countries . . . . .	161	125	18
<b>Total . . . . .</b>	<b>3,562</b>	<b>2,881</b>	<b>403</b>

Table 5 - Norwegian Exports of Unrefined Marine Oils, 1960-1963				
Product	1/1963	2/1962	1961	1960
	(Metric Tons)			
Whale oil, crude . . . . .	25,631	65,948	67,656	65,555
Sperm and bottlenose oil, crude . . . . .	4,664	12,975	8,815	8,682
Seal oil, crude . . . . .	1,773	2,646	2,117	3,859
Herring oil, crude . . . . .	98	125	398	199
Fish-liver oil . . . . .	18,078	14,950	18,767	15,564
Other unrefined marine oils . . . . .	5,590	8,988	8,582	4,989
<b>Total . . . . .</b>	<b>55,834</b>	<b>105,632</b>	<b>106,335</b>	<b>98,848</b>
1/ Preliminary.				
2/ Revised.				

since domestic consumption of hardened marine oils by the margarine industry was about the same as in the previous year. There has been a steady drop in the use of marine oils in Norway's production of margarine

from 57,170 tons in 1960 to 50,095 tons in 1963.

Note: See Commercial Fisheries Review, July 1963 p. 89.

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# SHIPYARDS TO BUILD SHRIMP VESSELS FOR KUWAIT:

A Norwegian shipbuilding sales organization has arranged to deliver 8 shrimp-fishing vessels and 1 supply vessel to the Kuwait National Fishing Company. The terms of the Kr. 20 million (US\$2,793,000) contract call for cash upon delivery within one year. The Norwegian contractor will build 1 of the 8 trawlers. The firm has subcontracted with other Norwegian shipyards to build the other 7 trawlers and the supply vessel. (News of Norway, April 30, 1964.)



## Peru

### FISH MEAL PRODUCTION AND EXPORTS, JANUARY-MARCH 1964:

Peruvian fish meal production in January-March 1964 was reported to be 496,000 metric tons, or 58 percent more than the 314,000 tons produced during the first quarter of 1963.

Peruvian fish meal exports during the first 3 months of 1964 amounted to 389,000 tons, up only 9.6 percent from the 355,000 tons exported in the same period of 1963. Fish meal inventories at the end of the first quarter of 1964 were said to total 258,000 tons as compared with inventories of 149,000 tons at the end of January-March 1963. (Unpublished sources.)



## South Africa

### FISHERIES TRENDS, EARLY 1964:

Following are excerpts from a report in the The Southern Africa Financial Mail, April 10, 1964, describing recent developments in the fishing industry of the South Africa Republic (including South-West Africa):

**Summary:** Fishing expectations and early results for 1964 indicate that the pilchard-masabanker shoal fishery may be headed for its seventh successive record year. While in-shore fishing will produce the bulk of the 1964 catch, there are also interesting developments



### South Africa (Contd.):

in deep-sea trawling, tuna fishing, and exploratory fishing.

**Pilchard-Maasbanker Fishery:** At Walvis Bay (South-West Africa), where just over 600,000 short tons of pilchards were landed at the jetties of 6 factories in 1963, a fleet of about 70 vessels in early April 1964 was taking fish about 6 to 7 hours sailing from port. Although that was farther away than normal, the trips were repaid by the excellent condition of the fish which yielded 16 to 18 gallons of body oil from each ton caught.

Plans called for the completion of 2 new fish meal factories in South-West Africa in June 1964. With the advent of the 2 new factories (1 in Walvis Bay and 1 in Luderitz), the South-West Africa pilchard quota has been raised to 720,000 short tons for 1964 (630,000 tons for Walvis Bay and 90,000 tons for Luderitz).

The South Africa Republic's Cape West Coast shoal fishery was hampered early in 1964 by the appearance of pilchards farther south than usual. The fish were found in the False Bay and Robben Island areas, which was a boon to the 2 factories at Hout Bay and the 1 at Gansbaai, but unfavorable to the majority of factories located at Saldanha Bay and further north. Vessels from the West Coast had to travel from 50 to well over 100 miles to take their catches. Despite the extended vessel trips, the pilchard-maasbanker catch of the South Africa Republic during the first 2 months of 1964 was 130,640 tons as compared with 119,973 tons in the same period of 1963. In the South African Cape West Coast shoal fishery there is no catch limit, but the season lasts only to the end of July.

Late in 1963 there were indications that another fish meal factory license might be granted to a group of leading South African fishermen. However, it is believed that some concern over heavy fishing of the pilchard shoals may persuade the South Africa Department of Commerce and Industries to postpone a decision on the new license, at least during 1964.

With indications of an increased catch in both South Africa and South-West Africa, it may be possible to reach the 1964 fish meal production goal of 300,000 short tons. (Editor's Note: That goal equals the 1964 export

quota assigned to South Africa by the Fish Meal Exporter's Organization.) More than 75 percent of the anticipated production has been sold in advance at a good price and there are ample markets for the remainder.

Once again, canned fish production will be limited and is not likely to exceed 2.5 million cases in 1964, which would be only half the canned fish pack of 5 million cases in 1960.

**Offshore Trawling:** A new company has been formed by South African-Spanish interests to carry out deep-sea trawling operations. Although detailed plans have not been announced, it is expected that the company will operate 4 to 6 large trawlers and establish a freezing and processing plant in South Africa at Saldanha Bay.

Another South African company was due to take delivery in May 1964 of the 130-ton stern trawler Sea Horse, the first of several trawlers being built for the company by a British shipyard.

A third South African company will start taking delivery in 1964 of 7 side trawlers and 2 stern trawlers being built for the company in Aberdeen, Scotland. In addition, a South African shipyard in Durban is completing two new stern trawlers for another South African fishing company which will operate the vessels from Port Nolloth.

**Tuna Fishing:** The potential tuna fishery off South Africa is also attracting investment. The former navy corvette Justin has been converted for tuna long-line fishing at a Durban shipyard at a reported cost of R100,000 (US\$139,000) by a South African company. The vessel will be used off South Africa.

Another South African company has been operating the converted refrigerated cargo vessel Marinette as a tuna vessel and is purchasing two more vessels in Europe for the tuna fishery.

**Fisheries Development:** The Fisheries Development Corporation of South Africa Ltd. is expanding its activities. (Editor's Note: Formed in 1944 under Section 2 of the Fishing Industry Development Act, the Corporation was created as a semipublic body with half its capital of almost \$2.8 million subscribed by the State.) As part of its new work in resource development, the Corporation has begun exploratory fishing and gear research to

## South Africa (Contd.):

find out if shrimp and anchovies can be caught commercially off South Africa. (United States Consul, Cape Town, April 21, 1964.)

Note: See Commercial Fisheries Review, May 1964 p. 72, Mar. 1964 p. 67, Dec. 1963 p. 78, Oct. 1963 p. 64.

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# PILCHARD-MAASBANKER FISHERY, JANUARY 1964:

The shoal fish catch off the Cape west coast of the South Africa Republic in January 1964 was 63,781 short tons pilchards, 3,666 tons maasbanker, and 594 tons mackerel for a total of 68,041 tons. That compares with 44,611 tons pilchards, 165 tons maasbanker, and 4,278 tons mackerel landed in January 1963.

The January 1964 catch yielded 15,765 short tons of fish meal, 563,874 imperial gallons of fish body oil, 312,456 pounds of canned pilchards, 533,208 pounds of canned maasbanker, and 125,088 pounds of canned mackerel. (The South African Shipping News and Fishing Industry Review, March 1964.)



## Republic of Togo

### FISHERY PRODUCTS IMPORTS FROM SOVIET UNION INCREASE IN 1963:

In 1963 the Soviet Union increased its exports of fishery products to Togo. Imported frozen fishery products of Soviet origin appear to have become very popular with the Togolese and are reported to be unloaded and sold directly from rail cars to the Togolese market women. Despite the noticeable increase and frequency of such imports, the consumer demand has kept pace with supplies and there has been no indication of a saturated market.

A four-man team of German fishing experts is expected to arrive in Togo during 1964. They will bring with them two 39-foot fishing vessels for offshore fishing. Two of the German experts will work with the Togolese in training them to operate the 2 vessels and the 2 other experts will teach the Togolese how to preserve and distribute fish. (United States Embassy, Lome, April 21, 1964.)



## U.S.S.R.

### SOVIET FISHING INDUSTRY:

Following are excerpts from a report by Alexander Ishkov, chairman of the Soviet State Committee of Fisheries:

**Fisheries Landings:** In 1963, landings by Soviet fishing vessels and whalers reached 4.5 million metric tons, exceeding the planned target by 380,000 tons. The Soviet catch goal for 1964 calls for landings to increase by 400,000 tons to 4.9 million tons; and in 1965, landings are expected to rise to well over 5 million tons.

The Soviet Union has nearly 29,000 miles of sea coast, opening onto a variety of seas, as well as some 211,000 miles of rivers, many of which are very large. The Soviet Union also has over 200,000 large lakes, covering nearly 12,000 square miles. Those include 102 artificial lakes created mainly in connection with hydro-electric and irrigation schemes. Those lakes are being developed as hatcheries for salmon, sturgeon, and other fish.

**Fishing Fleet:** The development of the Soviet fishing industry has required major capital expenditures. Seven out of 10 vessels and auxiliaries now operating in Soviet fisheries have been built in the last 10 years, and 120 new large vessels should be added in 1964, including 21 refrigerated trawlers. Many of the new vessels have been built in Soviet shipyards, but even more have been built to Soviet order by shipyards in Poland, East Germany, Finland, Japan, Denmark, West Germany, and certain other countries.

Construction of Soviet fishing vessels abroad is continuing. Poland, for example, is at work on a series of fishery motherhips to serve Soviet distant-water fleets. Polish shipyards also plan to deliver a series of large factory trawlers to the Soviet Union during the next two years. Each of the new factory trawlers should be capable of catching and processing 5,500-6,000 tons of fish annually.

As recently as 15 years ago, vessels operating from Soviet Baltic ports, which then constituted a major part of the Soviet fishing fleet, consisted only of small schooners which operated only in coastal waters. The Soviet Baltic fleet now includes numerous modern fishing vessels capable of operating in distant waters such as the fishing area now in active exploitation off west Africa. The Soviet Baltic

U. S. S. R. (Contd.):

fleet is supported at Illaipeda, Tallinn, and other ports by refrigerated warehouses and processing factories.

The Soviet Far Eastern fishing fleet, includes about 200 modern fishing vessels and 10 floating fish canneries which operate for 5 months of the year around the Kurile Islands. Those vessels landed about 500,000 tons of fish and other sea products in 1963, and are expected to increase their catch in 1964.

The Soviet herring fleet, operating from Murmansk and other ports on the Barents Sea, is fishing in the North Atlantic. The fleet, which has been aided by the research done by the submarine Severnyanka, is catching large herring at depths of 1,000 feet, and in certain areas at depths of 2,000-2,300 feet.

Other Soviet fleets are operating in the Black Sea and Sea of Azov, and in the Caspian Sea.

Fisheries Research: There are now 20 Soviet research institutes engaged in fishery research, with 4,000 scientists and technicians working out plans for further development of the fishing in dustry.

As a result of Soviet research, five special Soviet vessels will be fishing for tuna in the Indian and Pacific Oceans, and others will be fishing in the northwestern part of the Indian Ocean for tuna, "scomber," sailfish, and mackerel. (World Fishing, April 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 73, March 1964 p. 70, and February 1964 p. 84.

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## PACIFIC SALMON HATCHERIES AND FISHERIES:

The Chief of the Research Section of the Hokkaido (Japan) Salmon Hatchery, Japanese Fisheries Agency, and his assistant visited Primorskaya, Okhotsk, Kamchatka, and Sakhalin on the Pacific Coast of the Soviet Union in 1957 and 1959, respectively. They were participants in an exchange program on fishing techniques between the Soviet Union and Japan. There observations on Soviet fisheries have been kept current by information from visitors to the Soviet Union and dealings with Soviet delegations to Hokkaido. Following are some of their impres-

sions of the Soviet salmon hatcheries and fisheries in the Pacific coast:

Hatchery Program: The Japanese believe that the Soviets will rely on their natural salmon runs until the resource shows strong evidence of depletion. Only then will the Soviets begin full-scale development of their salmon hatcheries. The fact that only two members of Soviet fisheries delegations to Japan have been hatchery personnel suggests the low priority of the program at present. Earlier, during a joint scientific conference between the Soviet Union and Japan, the Soviets described plans to expand hatchery programs in Sakhalin, the Kurile Islands, and the Amur River area. But a visiting fisheries team from Japan in 1963 found no pronounced increase of hatchery activity in those areas.

The Japanese, however, were impressed by the overall administration of the hatchery program and the natural resources available to the Soviets. One river in Kamchatka is said to have more salmon than all the rivers of Hokkaido combined. Poachers pose little problem and wide rivers allow the salmon to swim unmolested to their natural spawning grounds. This contrasts with Japanese experience where the fish must be caught in midstream, then artificially transported to spawning areas. Soviet scientists also had such advantages as the use of helicopters to fly to and from hatcheries in remote areas.

The Soviet hatchery method is the same as the Japanese, both of which are similar to certain United States methods. One Soviet variation in technique, however, is the placing of incubation trays with eggs in a large indoor rearing pond rather than in troughs through which spring water runs as is the practice in Japan. The Japanese also stated that little encouragement is being given to the breeding of hybrid stock in the Soviet Union.

Fishing Industry: The Japanese were generally unimpressed by the Soviet salmon fishing industry and felt their own plants and techniques were superior. They reported that some Soviet salmon canneries were sorting and packing by hand, and using equipment installed by Japanese firms some years ago.

Standard of Living: To compensate for the remoteness and seasonal nature of the work, Soviet wages in the Pacific salmon fishing industry were set at 1.5 times the community average, and other incentives such as the de-

U. S. S. R. (Contd.):

velopment of recreation facilities, and a 10-percent annual increase in wages were used to retain workers.

The price of food was comparable to or only slightly higher than that in Japan, but the price of clothing was 4 to 5 times the Japanese level. (United States Consulate, Sapporo, April 15, 1964.)

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#### NORTH PACIFIC WHALING FLEET TO BE INCREASED:

The Soviet Fisheries Minister is reported to have informed the Production Chief of the Japanese Fisheries Agency that his Government plans to operate 4 whaling fleets in the Aleutian Island waters in 1964, according to informed sources in the Japanese Government. The Soviet Union operated 2 whale fleets in 1962 and 3 in 1963.

Japan intends to operate 3 mothership-type whaling fleets in the North Pacific, as before. They include the motherships Kinjo Maru (10,912 gross tons), Nitto Maru (12,933 gross tons), and the Kyokuyo Maru (11,449 gross tons). The three motherships were scheduled to depart Japan on May 20, 1964. (Suisan Keizai Shimbun, May 5; Suisancho Nippo, May 12, 1964.)

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#### ELECTRONIC FISHING GEAR BEING TESTED:

A Soviet research vessel has successfully conducted experiments in the equatorial Atlantic Ocean with electronic fishing gear, which can be used to catch sardines without the use of a net. The gear consists of a 100-kilowatt generator and a fish-suction pump, according to a Tass News Agency report dated April 16, 1964. Sardines attracted by means of a night light are "guided" to the mouth of the fish pump by means of electrical charges released in the water. The fish are then caught by suction. It is reported that by this method 3 to 4 tons of sardines can be landed in one night's fishing.

In the Pacific Ocean, the Soviet fishing vessel Yuri Gagarin is reported to have been experimentally fishing for saury with this type of electronic fishing gear for several years, achieving considerable success. So-

viet fishing gear experts are also said to be experimenting with electronic trawl gear to improve Soviet bottom-fishing techniques. (Suisancho Nippo, May 2, 1964.)

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#### UNDERWATER CRAFT DESIGNED FOR BARENTS SEA STUDIES:

The Soviet Institute for Scientific Research in Fisheries and Oceanography in the Arctic has designed and started construction of a self-surfacing bathyscaphe for investigations in the Barents Sea. It will carry a crew of 3 and will be able to work at depths up to 100 meters (328 feet), remaining submerged for up to 5 days. (World Fishing, April 1964.)

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#### FISHERY DEVELOPMENTS SINCE 1913:

The Soviet Government's aim in the fisheries is first and foremost to develop their fisheries to such a level that they fully and clearly meet the needs of the country. Therefore, the development and management of the fishing fleet are neither for profit nor export.

Parallel with the development of the fishing fleet, the U.S.S.R. has built an entire fleet of research vessels and exploratory ships for scientific investigations and for guiding the fishing fleet. The Soviets now have between 80 to 100 such vessels, which undertake investigations on all the most important fishing regions in the world. For example, they have recently undertaken research and fishing explorations in the Indian Ocean and will soon begin regular fishing there. The object of the States Fishery Committee is the rational utilization and conservation of the stocks of fish, and the Soviets cooperate as best they can with other countries which have the same viewpoint about carrying on the fisheries. Within the U.S.S.R., in rivers and lakes, the Soviets are also striving purposefully to protect the stocks of fish and to carry on fish rearing.

In 1913, the total Soviet catch was 1 million metric tons of which 200,000 tons were ocean fish and the rest (about 80 percent) were caught in the Caspian Sea, rivers, and lakes. In 1940, the total catch was 1.4 million tons, of which 556,000 tons were ocean fish. In 1950, the total catch increased to 1.75 million tons, and of this, the ocean fishery accounted for about 810,000 tons, or about half the total. The Soviets calculated that their total production for 1963 would be about 4.2 million tons, but in

## U. S. S. R. (Contd.):

November, the fishing fleet exceeded the production plans and the total catch for the year was expected to amount to about 4.5 million tons. The Soviet fishery in the Caspian Sea, rivers, and lakes together yield about 800,000 tons, or about as much as in 1913, but the ocean fishery now yields about 81 percent of the total catch.

In recent years emphasis has been placed on rebuilding and modernizing the fishing fleet, putting it in the best possible condition, and equipping it with the newest instruments. Large vessels are now mostly used, and they freeze the catches, pack them in boxes, and make fish meal out of what is left.

It is a great problem to maintain, and still more difficult to attain, an increase in the catch of fish. The country's industries, with their many dams, power stations, and factories on all the great rivers, to a large extent, destroy the fishery stocks and disturb the passage of fish. In inland waters the fishery also encounters the limits of overfishing. In the Sea of Azov, for example, the fishery there formerly accounted for about 230,000 metric tons annually, but now only about 200,000 metric tons. The same can be said of the Caspian Sea where the total catch in 1940 was 351,000 metric tons, contrasted to 340,000 metric tons today. But in reservoirs and inland lakes, the fishery has increased considerably with the help of fish culture. Fish ladders have also been built in all places where possible. They are of various types according to the circumstances and requirements of the various kinds of fish. Good results have resulted from many of them. For example, Soviet scientists promise more sturgeon in Soviet's great rivers in peacetime than there were before all the great dams were built. Salmon culture has given good results in the Kura and Kuban Rivers.

Formerly, most of the catch was salted, but now over 50 percent is frozen and much of it is also canned. The total production of salt fish is now less than before World War I when it was 340,000 tons (nearly half of the total catch). Now it is about 300,000 tons--only a small percentage of the total catch. The consumption of fish, which was formerly about 6 kilograms (13.2 lbs.) a year per capita, has now increased to over 12 kilograms (26.4 lbs.).

In recent years the Soviets have emphasized the building up of a fleet of large trawlers which can carry on many types of fisheries at sea far from the mother country. These are specially applicable to the fisheries in the Atlantic Ocean on the great banks of Newfoundland, Georges Bank, and Greenland, and off the West African coast. The fleet is divided into two principal categories: factoryship trawlers and fleet expeditions. The last category includes many trawlers accompanied by a mothership. They supply the transporting ship with catches of round fish, or dressed or drawn fish, and receive fuel and water from it. In contrast, the large factoryship trawlers fish and fully prepare their own catches until they have a complete load, and then sail with their catches to Soviet ports. There are two principal types of those trawlers:

1. Factoryship Trawlers: These vessels fish in the Northwest Atlantic, on the Newfoundland Banks, and Georges Bank. They are stern trawlers with freezers, are about 3,600 metric tons, have 2,000-hp. engines, storage for 750 metric tons, crews of 90 to 100 men, and can stay at sea for 90 days. They have freezing equipment that can quick-freeze 30-35 metric tons of fish fillets a day, and also filleting machines with a production capacity of 10-15 tons per day. They also have fish meal processing equipment which manufactures about 4 tons per day. In addition, those vessels have canning equipment, which is used principally to produce products from fish livers. The annual catch of one of those trawlers is 6,000 to 7,000 metric tons. They usually use trawls made of synthetic fiber.

2. After some research with fishing on Africa's west coast, the Soviets found that they could do better with another type of vessel. For this fishery, they have built stern trawlers of 2,900 metric tons with storage capacities of 560 metric tons, crews of 60-70 men, and freezing apparatuses that can daily freeze 30-35 metric tons. They have no filleting machines. They fish principally for sardines, mackerel, and other species, such as carangids. Both the factoryship trawlers and stern trawlers use synthetic fiber trawls with large, vertical openings. Under good conditions, they can take 20-25 metric tons per 2-hour tow. Tropic trawlers use midwater trawls which can be fished in any depth.

3. In the North Pacific Ocean, the Northeast Atlantic Ocean, and Barents Sea, the So-

## U. S. S. R. (Contd.):

vies use principally trawlers of the "Okean" type. They are of medium size: 650 metric tons with a capacity of 150 metric tons, 26-man crews, and can fish 30 to 35 days before returning to port. They often accompany a mothership which takes the catch and supplies them with fuel and water. They are equipped with trawls, purse seines, and gill nets. During autumn and over the winter, for example, they fish a great deal with gill nets in the region between Iceland and Norway; in the spring and summer they fish with trawls in the Barents Sea, Georges Bank, or on the Newfoundland Banks. These trawlers are not particularly well equipped. For example, they lack freezing equipment. The Soviets are now beginning to build new trawlers for this fishery which are somewhat larger.

4. "Maik" Type Trawlers: These vessels are 1,350 metric tons, have a capacity of 200 metric tons, 800 hp. engines, 30-man crews, and can stay at sea 50 to 55 days. This type trawler has freezing equipment that can freeze 6-7 tons daily. They can travel at 11-13 knots and are equipped with Russian hydroacoustic instruments of both horizontal and vertical types. They have mostly trawled at depths of 200-300 meters (656-984 feet), down to 400 meters (1,312 feet), and still fish mostly at those depths, but they have now also begun to trawl at 400-600 meters (1,312-1,969 feet), and in the Pacific Ocean down to 700 meters (2,297 feet), with good results.

Among new fishing gear is the Soviet mid-water trawl, which has given good results.

Fishing off the West African coast is shown to be profitable, and the fishery is beginning to be pursued. Most of the catch is brought to Soviet ports and only a part is sold on the spot, for example in Ghana. Fishing with a pump and light has been tried for North Sea herring, but with a complete lack of success.

The object of the Soviet fisheries is not to make a profit, but instead, to satisfy the Soviet people's demand for food. Shipbuilding continues, and the catches bring a steady price fixed by the Government. The fluctuation in the fish markets in other places have no influence on the price of fish in the Soviet Union.

Fishermen are paid in the following way:

1. Fixed "normal" pay, which is calculated on the basis of the vessel's filling its production goal.
2. A bonus for those vessels with a catch that exceeds the goal.
3. For those whose catch is disappointing, there is a guaranteed minimum share which is somewhat lower than the normal pay.

The Soviet fisheries are now approaching the established goal--to reach a yearly total catch of about 5 million metric tons--but the members of the Soviet Fishery Board think that the Soviet people really need about 7 million metric tons.

Note: Translation from Norwegian by Leslie W. Scattergood of article "Sovjetsamveldets fiskerier" (Soviet Fisheries), which appeared in *Fiskets Gang*, 50 årgang, nr. 7 (February 13, 1964), pp. 119-120.



## United Kingdom

## WORLDWIDE TARIFF REDUCTION ASKED BY BRITISH PRIME MINISTER:

The British Prime Minister confirmed in a speech April 9, 1964, that Britain's trade policies are aimed at achieving worldwide reductions in tariff barriers. The Prime Minister's remarks were made in London in the opening address to the European Purchasing Conference, which is composed of buyers from most European countries as well as from the United States, Canada, India, and Japan. The Prime Minister was reported to have said that the United Kingdom will have free trade by 1966 with all countries in the European Free Trade Association (EFTA). He noted that at present there are no such advantages for British trade in the European Economic Community (EEC), but nevertheless Britain's exports to the EEC are steadily increasing. On the Kennedy Round of tariff negotiations under the General Agreement on Tariffs and Trade, the Prime Minister was reported to have stated that Britain would go into the talks seeking a 50-percent general reduction in tariffs with a minimum of exceptions. (United States Embassy, London, April 13, 1964.)

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## BRITISH FISHING INDUSTRY:

The British fishing industry employs some 24,000 full-time and 6,000 part-time fishermen.

## United Kingdom (Contd.):

The principal fishing ports in England and Wales are Hull, Grimsby, Fleetwood, Milford Haven, and Lowestoft for white fish (cod, haddock, plaice, turbot, and sole) and Great Yarmouth and Lowestoft for herring.

The white fish fleet is made up of three main groups--the distant-water, the near- and middle-water, and the inshore vessels. The distant waters are those off Iceland, Greenland and the north coast of Norway, and the Barents Sea. The middle-water grounds lie around the Faroe Islands. The near-water grounds are in the North Sea, the Irish Sea, and the coastal areas around Britain. Herring fishing grounds are mainly within 60 miles of land.

Distant-water vessels (there are about 300 of them) are more than 140 feet long and make voyages of from 17 to 23 days; middle-water vessels are less than 140 feet long and their voyages can last from several days up to 2 weeks. Britain has more than 450 near-water and middle-water vessels. The capital invested in British fishing vessels is some £55 million (US\$154 million), and the public buy fish to the value of more than £100 million (\$280 million) a year.

The catch is usually distributed through wholesalers at the ports, who buy at auctions and sell to inland wholesalers. (Billingsgate Market, London, which handles more than 300 tons of fish a day, is the largest inland wholesale distributing center for fish in Britain, although other large cities have central fish markets.) Sixty special express fish trains transport the catch daily from the ports to inland centers, and increasing use is made of truck transport.

Every village, town, and city of Britain has fresh fish available within 24 hours of being landed. Retail sales are handled by some 30,000 fishmongers and about the same number of fish friers. Purchases by fish friers account for roughly one-third of the value of landings of white fish.

Frozen packaged fish--sold by other shops as well as fishmongers--is rapidly increasing in popularity and accounts for about 20 percent of all fish sold in Britain. (Commercial Fishing, March 1964.)

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## PRODUCTION OF FROZEN PROCESSED FISHERY PRODUCTS, 1963:

British production of frozen processed fishery products in 1963 amounted to 58,062 long tons, only 263 tons (or 0.5 percent) more than the previous year but up 3.4 percent from 1961. This is revealed in a report issued by the White Fish Authority, London.

Of the 1963 production, 27,445 tons were packed in bulk or institutional packs and 30,617 tons were packed in consumer packs. While the quantity put up in bulk or institutional packs in 1963 was 18.7 percent less than the previous year, the quantity packed in consumer packs increased 27.4 percent.

In addition to the domestic production, 18,748 tons were imported (10,451 tons in bulk or institutional packs and 8,297 in consumer packs) in 1963, somewhat less than in 1962.

British Production of Frozen Processed Fishery Products as Reported by the White Fish Authority				
Year	Fish Used	Amount Produced		
		Institutional Packs	Consumer Packs	Total
		(Long Tons)		
1963	129,000	27,445	30,617	58,062
1962	128,442	33,763	24,036	57,799
1961	127,020	29,996	26,161	56,157
1960	116,500	29,930	22,487	52,417

Home market sales of 73,901 tons in 1963 were up 17.0 percent from the previous year. The greater increase from 1962 was in home market sales of consumer packs (up 22.5 percent); sales of bulk or institutional packs were up 12.5 percent.

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## BRITISH FIRM PLANS TO EXPAND FLEET OF REFRIGERATED STERN TRAWLERS:

A British fisheries company has announced plans to order eight additional stern trawlers all of which will be equipped to freeze fish at sea. When completed the vessels will be assigned to Grimsby and Hull where they will serve as replacements for older vessels in the British company's fleet of 61 distant-water trawlers. (Only 16 vessels in that fleet are over 10 years old.)

The first of the new group of stern trawlers will be scheduled for delivery in June 1965.

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## United Kingdom (Contd.):

**NEW MACHINE CUTS FISH-DRYING  
PROCESS TO 30 HOURS:**

A machine that cuts the process of drying fish from 6 weeks to 30 hours has been developed at the British Government Torry Research Station in Aberdeen, Scotland. Since the machine can be used on board fishing vessels at sea, it will enable trawlers to operate in unexploited fishing grounds of the South Atlantic and dry their catches at sea.

Working in cooperation with the Torry Research Station, a Scottish shipyard has designed a new type of trawler to carry the drying machine. The vessel will be about 310 feet long--only slightly larger than conventional deep-sea trawlers. (Commercial Fishing, March 1964.)

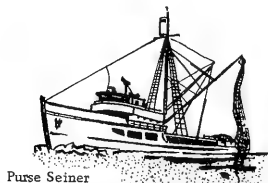
Note: See Commercial Fisheries Review, August 1963 p. 112.

**Viet-Nam****SHRIMP EXPORTS TO JAPAN UP IN 1963:**

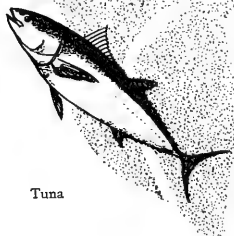
Viet-Nam's shrimp exports to the United States in 1963 were valued at US\$32,000, and were about unchanged from those of the previous year. In the same year, however, Japan's purchases of shellfish products from that country (769,000 pounds), particularly shrimp, were ten times greater than a year earlier and were valued at \$300,000. By increasing its purchases of spiny lobsters, mollusks, and shrimp, Japan replaced Hong Kong as Viet-Nam's best fishery customer. (United States Embassy, Saigon, May 6, 1964.)

**TUNA**

Tuna are wide-ranging inhabitants of the open sea; some species cross the oceans in their movements. Little note



Purse Seiner



Tuna

was paid them until 1903, when the sardine failed to appear in California waters. Today, more tuna are taken by United States fishermen than any other food fish and only the shrimp and salmon fisheries are more valuable. For many years, American fishermen in the famed tuna clippers pursued the fish along the coasts of the Americas from southern California to far below the Equator. At its peak in 1951, the clipper fleet numbered 228 boats. In the late 1950's, however, a revolution occurred in the United States tuna fishery as clipper after clipper converted to the more efficient purse seiner. This was possible because of the introduction of nylon seines and the development of the power block to handle the great nets. Four kinds of tuna--yellowfin, skipjack, albacore, and bluefin--and a tunalike fish, the bonito, are taken by our fishermen, largely off Central and South America. Recent landings have averaged nearly 300 million pounds, worth \$35 to \$40 million ex-vessel. From those landings and imported frozen tuna, West Coast processors annually put up a tuna pack worth more than \$140 million. For many years, California processors have led the world in the canning of tuna.

--Conservation Note 15, "Commercial Fisheries of the Pacific Coast," Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C. 20240.





# FEDERAL ACTIONS



## Department of Commerce

### AREA REDEVELOPMENT ADMINISTRATION

#### INDUSTRIAL LOAN TO MARYLAND PET FOOD FIRM APPROVED:

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce has approved an industrial loan of \$461,500 to help Custom Pet Food Packers, Inc., establish a plant at Princess Anne, Md., for the canning of dog and cat food. While cereals, beef, and poultry byproducts will constitute the principal ingredients of the pet food, the manufacturer anticipates using 48 tons of "trash" fish per day in the products.

The loan funds will be used to buy and improve land, to construct buildings, and to purchase machinery and equipment. The total cost of the project will be \$710,000. Production at the plant will require 123 workers, and in addition it is estimated that 36 directly related jobs will be generated in fishing and supply industries.

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#### SURVEY OF FISHERIES POTENTIAL IN CARTERET COUNTY, NORTH CAROLINA:

A technical assistance project to survey the expansion potential of the fisheries industry in Carteret County, N. C., has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce.

The 16-months research project is to be conducted by a firm in Morehead City, N. C. The U. S. Bureau of Commercial Fisheries will supervise the contract work. The technical assistance project will include: (1) a survey of fishery resources to determine present sufficiency and the potential for future development; (2) establishment of an experimental pilot-plant operation using modern techniques to produce new products for consumer tests to determine their acceptance

and marketability; and (3) a labor-skill survey to determine present skills and possible new requirements.

On the basis of the study results, recommendations will be made as to the most promising lines for expansion of existing seafood processing plants as well as the potential for new enterprises. The total cost of the fishery research project will be approximately \$40,000. ARA will finance \$36,000 of that amount with Carteret County contributing the balance.



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### NEW FOOD ADDITIVE REGULATION CONCERNING KELP:

A regulation prescribing the use of kelp as a source of iodine in foods for special dietary use was issued by the Commissioner of Food and Drugs, effective April 24, 1964, as an amendment to food additive regulations (Title 21, Code of Federal Regulations, Part 121).

The new regulation as it appeared in the Federal Register, April 24, 1964, follows:

### Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 121—FOOD ADDITIVES

Subpart D—Food Additives Permitted in Food for Human Consumption

#### KELP

The Commissioner of Food and Drugs, having evaluated the data in a petition

(FAP 411) filed by California Vegetable Concentrates, Inc., P.O. Box 149, Huntington Park, California; Diketan Laboratories, Inc., 9201 Wilshire Boulevard, Los Angeles, California; Kopco, Inc., Dock 1, Fort Huachuca, California; Philip R. Park, Inc., Berth 42, Outer Harbor, San Pedro, California; S. O. Barnes & Sons, Inc., 17250 South Main Street, Gardena, California; and Thurston Laboratories, 3355 Glendale Road, Los Angeles, California, and other relevant material, has concluded that a food additive regulation should issue to prescribe the use of kelp as a source of iodine in foods for special dietary use. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec. 409 (c) (1), 72 Stat. 1786; 21 U.S.C. 348(c) (1)), and under the authority delegated to the Commissioner by the Secretary of Health, Education, and Welfare (21 CFR 2.90; 29 F.R. 47), the food additive regulations are amended by adding to Subpart D a new section reading as follows:

#### § 121.1149 Kelp.

Kelp may be safely used as a source of iodine in foods for special dietary use when the amount of iodine so provided for daily intake does not exceed 0.15 milligram. The food additive kelp is the dehydrated, ground product prepared from *Macrocystis pyrifera*.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing. A hearing will be granted if the objections are supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

**Effective date.** This order shall be effective on the date of its publication in the FEDERAL REGISTER.

(Sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. 348 (c) (1))

Dated: April 20, 1964.

GEO. P. LARRICK, -  
Commissioner of Food and Drugs.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

### EASTERN PACIFIC YELLOWFIN TUNA FISHING REGULATIONS PROPOSED:

Notice of proposed regulations concerning catch quota, open seasons, and closed seasons for yellowfin tuna; and restrictions on tuna imports were published in the Federal Register, May 9, 1964, by the U.S. Department of the Interior. The proposed regulations are to be issued under the authority contained in subsection (c) of section 6 of the Tuna Conventions Act of 1950, as added by the Act of October 16, 1962.

The notice provided that consideration would be given to any data, views, or arguments pertaining thereto which were submitted in writing to the Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, Terminal Island, Calif., by June 8, 1964.

A public hearing also was held at the United Portuguese Club, 2818 Addison Street, San Diego, Calif., May 23, 1964, when interested persons were given an opportunity to comment orally on the proposed regulations.

The proposed regulations as they appeared in the Federal Register, May 9, 1964, follow:

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### [ 50 CFR Parts 280, 281 ]

### EASTERN PACIFIC TUNA FISHERIES

#### Notice of Proposed Rule Making

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), and section 6(c) of the Tuna Conventions Act of 1950 (64 Stat. 778), as amended by the Act of October 15, 1962 (76 Stat. 923; 16 U.S.C. 955), that the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations, by adding a new Subchapter H—Eastern Pacific Tuna Fisheries, consisting of Part 280—Yellowfin Tuna and Part 281—Restrictions on Tuna Imports. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be issued under the authority contained in subsection (c) of section 6 of the Tuna Conventions Act of 1950, as added by the Act of October 15, 1962. In accordance with the authority cited, after adoption of the regulations proposed as Part 280

and publication thereof in the **FEDERAL REGISTER**, such regulations are to become applicable to all vessels and persons subject to the jurisdiction of the United States on such date as the Secretary of the Interior shall prescribe, but in no event prior to an agreed date for the application by all countries whose vessels engage in fishing for species of fish covered by the Convention for the Establishment of an Inter-American Tropical Tuna Commission (1 U.S.T. 230), in the regulatory area on a meaningful scale of effective measures for the implementation of the Commission's recommendations applicable to all vessels and persons subject to their respective jurisdictions. Steps are being taken to reach agreement with the several countries whose fishermen participate in the tuna fisheries of the eastern Pacific Ocean looking toward July 1, 1964, as the date for the simultaneous application by all such countries of suitable conservation measures to be observed by their fishing vessels.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or arguments pertaining thereto which are submitted in writing to the Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, California, within the period of 30 days from the date of publication of this notice in the **FEDERAL REGISTER**. Interested persons will also be afforded an opportunity to comment orally on the proposed regulations at a public hearing to be held at United Portuguese Club, 2818 Addison Street, San Diego, California, beginning at 10:00 a.m., May 23, 1964. Any person who intends to present views orally at such hearing is requested to furnish in writing his name and the name of the organization he represents, if any, to the said Regional Director and not later than May 20, 1964.

Issued at Washington, D.C., and dated May 7, 1964.

JAMES K. CARR,  
Under Secretary of the Interior.

#### SUBCHAPTER H—EASTERN PACIFIC TUNA FISHERIES

#### PART 280—YELLOWFIN TUNA

Sec.	Definitions.
280.2	Basis and purpose.
280.3	Catch limit.
280.4	Open season.
280.5	Closed season.
280.6	Tuna clearance certificates.
280.7	Reports and record keeping.
280.8	Persons and vessels exempted.

**AUTHORITY:** The provisions of this Part 280 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

#### § 280.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) **Convention.** The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(b) **Commission.** The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(c) **Director of Investigations.** The Director of Investigations, Inter-American Tropical Tuna Commission, La Jolla, California.

(d) **Bureau Director.** The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) **Regional Director.** The Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, California.

(f) **Regulatory area.** All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines:

Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(g) **Yellowfin tuna.** Any fish of the species *Thunnus albacares* (synonym: *Neothunnus macropterus*).

(h) **Other tuna fishes.** Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonym: *Thunnus germi*).

(2) Bigeye—*Thunnus obesus* (synonym: *Parathunnus sibi*).

(3) Bluefin—*Thunnus thynnus* (synonym: *Thunnus saliens*).

(4) Skipjack—*Euthynnus pelamis* (synonym: *Katsuwonus pelamis*).

(i) **Fishing vessel.** Every kind, type or description of watercraft subject to the jurisdiction of the United States (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting its catch of fish from fishing grounds.

(j) **Transport vessel.** Every kind, type or description of watercraft subject to the jurisdiction of the United States used or capable of being used exclusively to take on board on the high seas and transport to a port of the United States the catches of fishing vessels of the United States.

(k) **Person.** Individual, association, corporation or partnership subject to the jurisdiction of the United States.

(l) **Open season.** The time during which yellowfin tuna may lawfully be captured and taken on board a fishing vessel in the regulatory area without limitation on the quantity permitted to be retained during each fishing voyage. Unless otherwise specified, whenever time is stated in hours it shall be construed to refer to standard time in the area affected.

(m) **Closed season.** The time during which yellowfin tuna may not be taken or retained on board a fishing vessel in quantities exceeding the amounts permitted to be taken and retained as an incident to fishing for other tuna fishes.

#### § 280.2 Basis and purpose.

(a) At a special meeting held at Long Beach, California, on September 14, 1961,

the Commission recommended to the Governments of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1961. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16-18, 1962; at Panama City, Panama, April 16-17, 1963; and at San Diego, California, March 18-19, 1964; the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation in effecting the recommended conservation measures.

(c) At a meeting held at San Diego, California, on March 20, 1964, representatives of the Governments of Costa Rica, Ecuador, Japan, Mexico, and the United States of America gave assurances that beginning as of July 1, 1964, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in March 1964 for a yellowfin tuna conservation regime. Subsequent to March 20, 1964, the Governments of \_\_\_\_\_ and \_\_\_\_\_ gave like assurances. The several countries named are parties to the Convention or, not being parties, exercise jurisdiction over vessels which "engage in fishing for species covered by the Convention in the regulatory area on a meaningful scale, in terms of effect upon the success of the conservation program" within the purview of section 6(c) of the Tuna Conventions Act of 1950, as amended.

(d) The regulations in this part are designed to implement the Commission's

current and future applicable recommendations for the conservation of yellowfin tuna so far as they affect all vessels and persons subject to the jurisdiction of the United States.

#### § 280.3 Catch limit.

The annual limitation on the quantity of yellowfin tuna permitted to be taken from the regulatory area during the open season by the fishing vessels of all nations participating in the fishery will be fixed and determined on the basis of recommendations made by the Commission pursuant to paragraph 5 of Article II of the Convention. Upon approval by the Secretary of State and the Secretary of the Interior of the recommended catch limit, announcement of the catch limit thus established shall be made by the Bureau Director through publication of a suitable notice in the FEDERAL REGISTER. The Bureau Director, in like manner, shall announce any revision or modification of an approved annual catch limit which may subsequently enter into force.

#### § 280.4 Open season.

The open season for yellowfin tuna fishing shall begin annually at 12:01 a.m. of the first day of January and terminate at midnight on a date to be determined and announced as provided in § 280.5.

#### § 280.5 Closed season.

(a) Pursuant to authority granted by the Commission, the Director of Investigations maintains records of the catches of yellowfin tuna taken from the regulatory area and landed from time to time during the open season by the fishing vessels of all nations participating in the fishery. By taking into account the aggregate weight of the yellowfin tuna landed and the estimated additional quantities of yellowfin tuna expected to be taken by the fishing vessels of all nations operating in the regulatory area, the Director of Investigations will determine the date on which he deems the annual catch limit will be reached and will promptly notify the Bureau Director of such date. The Bureau Director shall announce the season closure date thus established by publication in the FEDERAL REGISTER. The closure date so announced shall be final except that if it shall at any time become evident to the Director of Investigations that the catch limit will not be reached by such date, he may substitute another date which shall be announced by the Bureau Director in like manner as provided for the date originally determined.

(b) Except as provided in paragraphs (c) and (d) of this section, after the date is determined in the manner provided in this section for the closing of the yellowfin fishing season, the taking of yellowfin tuna shall be prohibited until the yellowfin tuna fishing season reopens on January 1 next following the close of the season.

(c) Any fishing vessel which has departed port to engage in yellowfin tuna fishing pursuant to a tuna clearance certificate last validated prior to the date of the closure of the yellowfin fishing season may continue to take and retain yellowfin tuna without restriction as to quantity until the fishing voyage has been completed by unloading in port or by transferring to a transport vessel the whole or any part of the fishing vessel's cargo of tuna.

(d) After the close of the yellowfin tuna fishing season as provided in this section, yellowfin tuna captured as an incident to fishing for other tuna fishes may be taken on board a fishing vessel and landed or transferred to a transport vessel in an amount not exceeding fifteen percent by weight of all tuna fishes landed or transferred by the fishing vessel.

(e) At any time during the closed season a transport vessel, without regard to the quantities of yellowfin or other tuna fishes possessed on board the transport vessel, may receive, possess and transport to a port of the United States yellowfin tuna lawfully taken and transferred by a fishing vessel on the high seas. Provided, That no yellowfin tuna in any amount may be transferred from a fishing vessel or be received on board a transport vessel during the closed season unless an officer authorized to enforce the regulations in this part is aboard the transport vessel for the purpose of inspecting all such transfers.

#### § 280.6 Tuna clearance certificates.

(a) Except as permitted by § 280.3, after the first day of July 1964, no person shall use a fishing vessel or a transport vessel for the capture, retention, transportation, or landing of yellowfin tuna in any quantity from the regulatory area during the open season unless such vessel shall have first been registered and cleared for yellowfin tuna fishing or for transporting yellowfin tuna in conformity with the provisions of this section.

(b) The managing owner, master, or other person in charge of a fishing vessel or a transport vessel may register such vessel to engage in yellowfin tuna fishing or in transporting yellowfin tuna from the fishing grounds by furnishing, either by letter or on a form to be supplied by the Bureau of Commercial Fisheries, information specifying the names and addresses of the managing owner and master, respectively, of the vessel, and the name, official number, home port, and cargo capacity (in tons of frozen tuna) of the vessel. Such application shall be submitted to the Regional Director who shall, without charge, issue in the name of the fishing vessel or transport vessel a certificate evidencing its registration to engage in yellowfin tuna fishing or in transporting yellowfin tuna during the calendar year applied for. Each such certificate shall expire at the end of the calendar year during which it is issued and shall be replaced by a new certificate upon application made in like manner as prescribed for the original certificate. New certificates shall similarly be issued to replace lost or mutilated certificates.

(c) Except as provided in paragraph (f) of this section, not earlier than 48 hours prior to each departure from port to engage in fishing for or transporting yellowfin tuna during the open season for such tuna, the master or other person in charge of a fishing vessel or a transport vessel or the agent of such person shall present the vessel's tuna clearance certificate for validation. Validation of a tuna clearance certificate shall be accomplished in the manner specified in paragraph (d) of this section. Such validation shall terminate at the time of the first discharge thereafter of any part of the tuna taken on board during the

voyage authorized by the validated certificate.

(d) Validation of a tuna clearance certificate as required in paragraph (c) of this section shall, upon request and only during the open season on yellowfin tuna, be entered as an endorsement made by an authorized validating officer upon the certificate held by the fishing vessel or transport vessel. Authorized officers as listed below, and their authorized representatives, may perform the functions of authorized validating officers:

(1) For vessels departing ports of the United States—

Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, Terminal Island, California; and Regional Director, Pacific Northwest Region, Bureau of Commercial Fisheries, Arcade Building, Seattle, Wash.

Officers of the United States Bureau of Customs.

Officers of the United States Coast Guard, Officers and employees of the Commonwealth of Puerto Rico.

(2) For vessels departing foreign ports—

The officer-in-charge at each of the following United States Consular posts:  
Colombia: Barranquilla, Bogota, Buenaventura, and Cali.  
Chile: Antofagasta, Concepcion, Santiago, and Valparaiso.  
Costa Rica: Puntarenas and San Jose.  
Ecuador: Guayaquil and Quito.  
El Salvador: San Salvador.  
Guatemala: Guatemala.  
Mexico: Mexico, D.F., and Mazatlan.  
Nicaragua: Managua.  
Panama: Colon and Panama.  
Peru: Arequipa and Lima.

(e) As circumstances require, the Bureau Director is authorized to time shall revise the list of authorized validating officers by publishing appropriate changes in the FEDERAL REGISTER. In the event an authorized validating officer is not available in port at the time of impending departure of a fishing vessel on a fishing voyage, a validation of the nature required by paragraph (c) of this section may be obtained by letter or prepaid telegraphic communication.

(f) A validation by an authorized validating officer shall not be required for a vessel departing a foreign port in any case where the Bureau Director finds and publishes notice thereof in the FEDERAL REGISTER that the Government of the country in which the port is situated has in force conservation measures which are adequate to meet the objectives of this section, including the means for providing documentary evidence establishing the date of departure of the vessel to engage in fishing for or transporting yellowfin tuna.

(g) The tuna clearance certificate and validation endorsements thereon issued as provided in this section shall at all times be carried on board the vessel for which issued and such certificate, the vessel, and its cargo shall at all times be subject to inspection for the purposes of this part by officers authorized to enforce the provisions of this part.

#### § 280.7 Reports and record keeping.

The master or other person in charge of a vessel holding a tuna clearance certificate issued under this part shall—

(a) Keep an accurate log of all operations conducted from the vessel entering therein for each day the date, noon position (stated in latitude and longitude or in relation to known physical features) and the estimated quantities (in short tons) of tuna fish by species which are taken on board the vessel: *Provided*, That the fishing record and bridge log maintained at the request of the Commission shall be deemed a sufficient compliance with this paragraph whenever the items of information specified herein are fully and accurately entered in such log.

(b) Report by radio at least once each calendar week during a fishing voyage conducted in the open season; such reporting to begin on a date to be announced by the Bureau Director through publication of a suitable notice in the *FEDERAL REGISTER* and to continue throughout the open season. Reports by radio shall be made directly or through a cooperating vessel to Radio Station WVVJ, La Jolla, California, 4415.8 kc or 8805.6 kc or by prepaid commercial radio message directed to the Director of Investigations. Radio reports shall be made between 0900 and 2400 P.S.T. and shall state the name of the fishing vessel and the cumulative estimated quantities, by species, of all tuna fish taken on board from week to week throughout the duration of the fishing voyage. Weekly reports containing all items of information required by this paragraph may be submitted to the Director of Investigations by a shore representative of the vessel master in lieu of the radio reports from the vessel.

(c) Furnish on a form supplied by the Bureau of Commercial Fisheries, immediately following the delivery or sale of a catch of tuna made by means of such vessel, a report, certified to be correct, giving the name and official number of the fishing vessel, the dates of commencement and conclusion of the fishing voyage and listing separately by species and weight in pounds or short tons, the gross quantities of each species of tuna fish so sold or delivered: *Provided*, That, at the option of the vessel master or other person in charge, a copy of the fish ticket, weight-out slip, settlement sheet, or similar record customarily issued by the fish dealer or his agent may be used for reporting purposes, in lieu of the form supplied by the Bureau of Commercial Fisheries, if such alternate record is similarly certified and contains all items of information required by this paragraph: *Provided*, That any vessel landing its catch in California and reporting by means of a copy of the California fish ticket may indicate the California Fish and Game boat number in lieu of the vessel's official number. Such report shall be delivered or mailed to the Regional Director within 48 hours after the weight-out has been completed.

#### § 280.8 Persons and vessels exempted.

Nothing contained in §§ 280.2 to 280.7 shall apply to:

(a) Any person or vessel authorized by the Commission, the Bureau Director, or any State of the United States to engage in fishing for research purposes.

(b) Any vessel documented as a common carrier by the Government of the United States and engaged exclusively in the carriage of freight and passengers

(other than a transport vessel as defined in § 280.1(i)).

(c) Any vessel of less than ten gross tons.

(d) Any person or vessel engaged in sport fishing for personal use.

### PART 281—RESTRICTIONS ON TUNA IMPORTS

#### Sec.

##### 281.1 Definitions.

##### 281.2 Basis and purpose.

##### 281.3 Species subject to regulation.

##### 281.4 Species under investigation by the Commission.

##### 281.5 Investigations authorized.

##### 281.6 Publication of findings.

##### 281.7 Proof of admissibility.

##### 281.8 Removal of import restrictions.

**AUTHORITY:** The provisions of this Part 281 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

#### No. 92—Pt. I—3

##### § 281.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *United States*. All areas under the sovereignty of the United States, the Trust Territory of the Pacific Islands, and the Canal Zone.

(b) *Convention*. The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(c) *Commission*. The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(d) *Bureau Director*. The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) *Regulatory area*. All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines:

Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 120 degrees west longitude; thence due south to the parallel of 10 degrees north latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees north latitude; thence due east to a point on the mainland where the parallel of 30 degrees north latitude intersects the coast.

(f) *Yellowfin tuna*. Any fish of the species *Thunnus albacares* (synonym: *Neothunnus macropterus*).

(g) *Other tuna fishes*. Those species (and none other) of the family Scombridae which are known as:

(1) *Albacore*—*Thunnus alalunga* (synonym: *Thunnus germon*).

(2) *Bigeye*—*Thunnus obesus* (synonym: *Parathunnus sibi*).

(3) *Bluefin*—*Thunnus thynnus* (synonym: *Thunnus salens*).

(4) *Skipped jack*—*Euthynnus pelamis* (synonym: *Katsuwonus pelamis*).

(h) *Fishing vessel*. Every kind, type or description of watercraft (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(i) *Person*. Individual, association, corporation or partnership.

#### § 281.2 Basis and purpose.

(a) At a special meeting held at Long Beach, California on September 14, 1961, the Commission recommended to the Governments of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16-18, 1962; at Panama City, Panama, April 16-17, 1963; and at San Diego, California, March 18-19, 1964; the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, co-operation in effecting the recommended conservation measures.

(c) At a meeting held at San Diego, California, on March 20, 1964, representatives of the Government of Costa Rica, Ecuador, Japan, Mexico, and the United States of America gave assurances that beginning as of July 1, 1964, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in March 1964 for a yellowfin tuna conservation regime. Subsequent to March 20, 1964, the Governments of \_\_\_\_\_ and \_\_\_\_\_ gave like assurances. The several countries named are parties to the Convention or, not being parties, exercise jurisdiction over vessels which engage in fishing for species covered by the Convention in the regulatory area on a meaningful scale,

in terms of effect upon the success of the conservation program," within the purview of section 6(c) of the Tuna Conventions Act of 1950, as amended.

(d) In conformity with the provisions of section 6(c) of the Act and simultaneously with the adoption of the regulations in this part, the Secretary of the Interior has made effective Part 280 of this title for the purpose of carrying out the current and future recommendations of the Commission for the conservation of yellowfin tuna in the regulatory area so far as such recommendations affect all vessels and persons subject to the jurisdiction of the United States.

(e) The yellowfin tuna stocks recommended for regulation by the Commission constitute a significant part of an international high seas fishery in which the vessels of a number of countries are engaged in varying degrees. Since some of the countries are not parties to the Convention and, therefore, have no applicable treaty obligations to fulfill, the achievement of the conservation objectives with respect to the tuna resources of the eastern Pacific Ocean is dependent upon international cooperative efforts to implement the Commission's recommendations. With a view toward encouraging effective cooperation on the part of such countries, the Tuna Conventions Act of 1950, as amended, directs that restrictions be established on the importation of certain tuna fish from any country which shall fail to take action to prevent the occurrence of certain prohibited activities. Thus, section 6(c) of the Act provides that the Secretary of the Interior, with the concurrence of the Secretary of State, shall promulgate regulations—

(1) To prohibit the entry into the United States, from any country when the vessels of such country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area; and

(2) To prohibit entry into the United States from any country, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area by vessels other than those of such country in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission.

(f) Section 6(c) of the Act further provides that "in the case of repeated and flagrant fishing operations in the regulatory area by the vessels of any country which seriously threaten the achievement of the objectives of the Commission's recommendations, the Secretary of the Interior, with the concurrence of the Secretary of State, may, in his discretion, also prohibit the entry from such country of such other species of tuna, in any form, as may be under investigation by the Commission and which were taken in the regulatory area."

(g) The regulations in this part are designed to implement the provisions of section 6(c) of the Act with respect to

import controls and to prescribe procedures for the establishment of restrictions on imports of tuna whenever such action shall be deemed warranted.

#### § 281.3 Species subject to regulation.

The species of fish currently subject to regulation pursuant to a recommendation of the Commission within the meaning of section 6(c) of the Act is yellowfin tuna.

#### § 281.4 Species under investigation by the Commission.

The species of fish currently under investigation by the Commission within the meaning of section 6(c) of the Act are yellowfin tuna, skipjack tuna, and bigeye tuna.

#### § 281.5 Investigations authorized.

(a) The Bureau Director shall cause to be made from time to time such inquiries and investigations as may be necessary to keep himself and other persons concerned currently informed regarding the nature and effectiveness of the measures for the implementation of the Commission's recommendations which are being carried out by countries whose vessels engage in fishing within the regulatory area. In making a finding as to whether or not a country is condoning the use of vessels in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, the Bureau Director shall take into account, among such other considerations as may appear to be pertinent in a particular case, the following factors:

(1) Whether or not the country provides or causes to be provided to the Commission pertinent statistics on a timely basis.

(2) Whether or not the country has in force conservation measures applicable to its own fishermen adequate for the implementation of the Commission's recommendations.

(3) Whether or not the country has in force measures for the control of landings in its ports of species subject to regulation which are taken in the regulatory area by fishermen of other countries contrary to the Commission's conservation recommendations.

(4) Whether or not the country, having put conservation measures into effect, takes reasonable action to enforce such measures.

(5) The number of vessels of the country which conduct fishing operations in the regulatory area.

(6) The quantity of species subject to regulation taken from the regulatory area by the country's vessels contrary to the Commission's conservation recommendations and its relationship to (i) the total quantity permitted to be taken by the vessels of all countries participating in the fishery and (ii) the quantity of such species sought to be restored to the stocks of fish pursuant to the Commission's conservation recommendations.

(7) Whether or not repeated and flagrant fishing operations in the regulatory area by the vessels of the country seriously threaten the achievement of the objectives of the Commission's recommendations.

(b) Any person who shall have reason to believe that the vessels of any country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission or that other acts within the purview of the import control provisions of section 6(c) of the Tuna Conventions Act of 1950, as amended, are occurring or are likely to occur, may communicate his belief to the Bureau Director. Every such communication shall contain or be accompanied by a full statement of the reasons for the belief, including a detailed description of such specific acts or events as may support the belief, and such other pertinent facts as may indicate a need for instituting an investigation as authorized in this part.

(c) Upon receipt by the Bureau Director of any communication submitted pursuant to paragraph (b) of this section and found to comply with the requirements of that paragraph, the Bureau Director promptly shall cause such investigation to be made as appears to be warranted by the circumstances of the case. In conducting such investigation the Bureau Director or his designated representative shall consider any representations offered by foreign interests, importers, brokers, domestic producers, or other interested persons. Unless good cause to the contrary shall exist, every such investigation shall be completed within 60 days following receipt of the communication.

#### § 281.6 Publication of findings.

If it shall be determined on the basis of § 281.5 that species of fish subject to regulation or under investigation by the Commission, as the case may be, are ineligible for entry into the United States from a particular country pursuant to the provisions of section 6(c) of the Act, the Bureau Director, with the approval of the Secretary of the Interior and the Concurrence of the Secretary of State, when required by law, shall publish a finding to that effect in the FEDERAL REGISTER. Effective upon the date of publication of such finding in the FEDERAL REGISTER every shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry either directly or indirectly from the country named in the finding shall be denied entry unless it shall be established by satisfactory proof pursuant to § 281.7 that a particular shipment of such fish is not ineligible for entry. *Provided*, That entry shall not be denied and no such proof shall be required for any such shipment which, on the date of such publication, was in transit to the United States on board a vessel operating as a common carrier.

#### § 281.7 Proof of admissibility.

For the purposes of § 281.6 of this part and section 8(c) of the Tuna Conventions Act of 1950, as amended, a shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry, directly or indirectly, from a country named in a finding published under such § 281.6 shall be deemed to be eligible for entry if the shipment is accompanied by a certificate of eligibility, executed in the form and manner set forth below, certi-

fying that the tuna in the shipment are not of the species specified in the published findings or, if of such species, were not taken in the regulatory area. The required certificate of eligibility must be executed by a duly authorized official of the country named in the published finding and the certificate must be authenticated with respect to the signature and official position of the person executing the same by a consular officer or consular agent of the United States.

#### CERTIFICATE OF ELIGIBILITY

I, \_\_\_\_\_, an authorized officer of the Government of \_\_\_\_\_, certify that the shipment of tuna fish accompanied by this certificate, consisting of \_\_\_\_\_ of \_\_\_\_\_ (Quantity)

\_\_\_\_\_ in \_\_\_\_\_ (Species) (Number and kind of packages or containers)

bearing the following marks and numbers \_\_\_\_\_:

(a) Contains no fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended.

(b) Contains fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended, but that such fish were caught in the waters of \_\_\_\_\_ (Identify area or areas in which fish were taken)

by vessels subject to the jurisdiction of \_\_\_\_\_, and that none of the said fish (Country) was taken in any part of the eastern Pacific Ocean subject to conservation regulations pursuant to recommendations of the Inter-American Tropical Tuna Commission.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Address)

[This certificate must be accompanied by a certificate of authentication executed by a consular officer or consular agent of the United States.]

#### § 281.8 Removal of import restrictions.

Upon a determination by the Bureau Director that the conditions no longer exist which warranted the imposition of import restrictions against the country named in the finding published pursuant to § 281.6, the Bureau Director, with the approval of the Secretary of the Interior, shall publish a finding to such effect in the FEDERAL REGISTER. Effect shall be given upon the date of publication of such finding, the prior existing import restrictions against the country designated therein shall terminate; *Provided*, That for a period of one year from such date of publication every shipment of fish in any form of the species subject to regulation or under investigation by the Commission shall continue to be denied entry unless the shipment is accompanied by a certification executed by an authorized official of the country of export and authenticated by a consular officer or consular agent of the United States, certifying that no portion of the shipment is comprised of fish which are of species under regulation and which were prohibited from entry under the prior existing import restrictions.



## Office of Emergency Planning

### ALASKA AND A CALIFORNIA COUNTY DECLARED MAJOR DISASTER AREAS:

Two Notices of Major Disaster dated May 1, 1964, by the Office of Emergency Planning concerning the States of Alaska and California as a result of the earthquake beginning March 27, and its adverse consequences, were published in the Federal Register of May 7, 1964. Under the Act of September 30, 1950, Federal assistance to States and local governments is warranted in major disasters.

The Director of the Office of Emergency Planning has determined the entire State of Alaska to have been adversely affected, and has also determined that Del Norte County in California was affected by seismic sea waves of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to supplement State and local efforts.

The Notices as published in the May 7, Federal Register follow:

## OFFICE OF EMERGENCY PLANNING

### ALASKA

#### Notice of Major Disaster

Pursuant to the authority vested in me by the President under Executive Order 10427 of January 16, 1953, Executive Order 10737 of October 29, 1957, and Executive Order 11051 of September 27, 1962 (18 F.R. 407, 22 F.R. 8739, 27 F.R. 9683); Reorganization Plan No. 1 of 1958, Public Law 85-763, and Public Law 87-296; by virtue of the Act of September 30, 1950, entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" (42 U.S.C. 1855-1855e), as amended; notice is hereby given of a declaration of "major disaster" by the President in his letter to me dated March 28, 1964, reading in part as follows:

I hereby declare a major disaster in those areas of Alaska adversely affected by the earthquake beginning on March 27.

I do hereby determine the entire State of Alaska to have been adversely affected by the catastrophe declared a major disaster by the President in his declaration of March 28, 1964.

Dated: May 1, 1964.

### CALIFORNIA

#### Notice of Major Disaster

Pursuant to the authority vested in me by the President under Executive Order 10427 of January 16, 1953, Executive Order 10737 of October 29, 1957, and Execu-

tive Order 11051 of September 27, 1962 (18 F.R. 407, 22 F.R. 8799, 27 F.R. 9683); Reorganization Plan No. 1 of 1958, Public Law 85-763, and Public Law 87-286; by virtue of the Act of September 30, 1950, entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" (42 U.S.C. 1855-1855g), as amended; I am hereby given of a declaration of "major disaster" by the President in his letter to me dated April 1, 1964, reading in part as follows:

I have determined the damage in Del Norte County, California, adversely affected by seismic sea waves beginning on or about March 27, 1964, to be of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to supplement State and local efforts.

Dated: May 1, 1964.

EDWARD A. McDERMOTT,  
Director,  
Office of Emergency Planning.



## United States Court of Appeals for the Fifth Circuit

### FISHERMEN CONSIDERED INDEPENDENT CONTRACTORS FOR TAX PURPOSES:

On March 3, 1964, in the tax refund case, United States v. Crawford Packing Company, the United States Court of Appeals for the Fifth Circuit upheld a ruling that captains and fishermen aboard shrimp vessels who work on a share basis are independent contractors for Federal employment tax and income withholding tax purposes. The ruling had been handed down January 23, 1962, by a Judge in the United States District Court for the Southern District of Texas. The District Court had ruled that the Government did not overcome Crawford's clear showing that the fishermen were free from direction and control of their fishing activities and that their earnings were dependent solely upon their skill, initiative, weather, and good fortune.

The decision only affects the liability of the vessel owners for Federal employment and income withholding taxes. It does not relieve them from liability for injuries to fishermen, nor interfere with the ancient rights of fishermen to maintenance and cure, nor any rights under the Jones Act.

**Editor's Note:** The decision by the Court of Appeals for the Fifth Circuit in the Crawford Packing Company case appears to be in conflict with the decision of December 6, 1963, by the Court of Appeals for the First Circuit

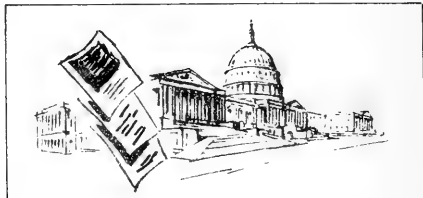
which upheld a ruling that fishing vessel crews and captains who operate under the "share" system are considered employees for Federal tax purposes.

Note: See Commercial Fisheries Review, Jan. 1964 p. 79, July 1963 p. 107, Aug. 1962 p. 95, and May 1962 p. 78.



## Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ALASKA DISASTER:** Senator Gruening from the floor of the Senate May 21, 1964 (Congressional Record, pages 11170-11171) pointed out that: "... I have been urging for some time now that the Administrator of the Small Business Administration, . . . lower the interest rate on disaster loans to Alaska victims to three-fourths of 1 percent--the same amount charged to foreign borrowers under the foreign aid program. . . ." The latest addition to the list of supporters for the idea is the executive council of the AFL-CIO, which on May 20 adopted a resolution supporting it. The Senator requested that the resolution adopted by the AFL-CIO council be printed in the Record.

**ALASKA OMNIBUS ACT AMENDMENTS:** H. Rept. 1410, Amending the Alaska Omnibus Act (May 14, 1964, report from the Committee on Interior and Insular Affairs, House of Representatives, 88th Congress, 2nd Session), 6 pp., printed. The Committee recommended passage (with amendments) of H.R. 11037, to amend the Alaska Omnibus Act, as amended, to increase by \$23.5 million the amount authorized to be appropriated for grants to assist the State of Alaska to assume burdens which were borne by the Federal Government while it was a territory and to extend to June 30, 1966, the period for which such grants may be made, and to extend by two years the time during which the Federal Government may continue to provide in Alaska certain services that normally belong to a State and during which property used for providing such services may be transferred to the State. Contains the purpose, need, committee amendment, cost, executive recommenda-



tion, committee recommendation, and changes in existing law.

On May 18, 1964, the House passed S. 2772 (in lieu of H. R. 11037), to amend the Alaska Omnibus Act authorizing an additional grant of \$23.5 million to the State of Alaska for earthquake recovery purposes. This action cleared the bill for the President's signature.

On May 27, 1964, the President signed S. 2772 into law (P. L. 88-311).

On May 27, 1964, a communication was received from the President containing a draft of proposed legislation to amend the Alaska Omnibus Act to provide assistance to Alaska for reconstruction of damage by the earthquake last March. Referred to House Committee on Interior and Insular Affairs and Senate Committee on Public Works.

S. 2881 (Bartlett et al) introduced in the Senate and H. R. 11438 (Rivers) introduced in the House on May 28, 1964, bills to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes; referred to the Senate and House Committee on Interior and Insular Affairs. Senator Bartlett's descriptive remarks when he introduced the bill appear in that day's Congressional Record (pages 11779-11783).

On June 3, 1964, Senator Gruening spoke from the floor of the Senate and inserted in the Congressional Record (pages 12159-12163), the statement of the Attorney General of Alaska before the Senate Interior and Insular Affairs Committee on S. 2881, which would amend the Alaska Omnibus Act, to provide assistance to help the State recover from the effects of the earthquake and subsequent seismic waves. Included in his remarks were proposed amendments. One amendment would reduce the rate of interest on any loans made by the U.S. Government to Alaska to a rate lower than 3 3/8 percent.

On the same date the Senate Committee on Interior and Insular Affairs held and concluded hearings on S. 2881.

The Subcommittee on Territorial and Insular Affairs of the House Committee on Interior and Insular Affairs held hearings June 11, 1964, on H. R. 11438.

**ALASKA TRANSPORTATION RATES:** On June 4, 1964, Senator Gruening spoke from the floor of the Senate concerning the possible reduction of the transportation rates to Alaska. The Senator also referred to the recent filing of a tariff with the Interstate Commerce Commission by the Trans-Continental Freight Bureau which was to become effective June 10. (Congressional Record, pages 12239-12242.)

**ANADROMOUS FISH CONSERVATION:** The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings May 26, 27, and 28, 1964, on H. R. 2392 and H. R. 11160 and similar bills authorizing the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with several States. All witnesses appearing before the Subcommittee favored the principles set forth in the bills. The Commissioner of the Fish and Wildlife Service appeared

on behalf of the Interior Department and endorsed H. R. 2392, recommending amendments now incorporated into H. R. 11160. He pointed out that the Service needs additional authority to cooperate with the states in developing plans for the management and manipulation of water and anadromous fish. He indicated such legislation would supplement the Fish and Wildlife Coordination Act. He then recommended a cooperative program with the states, one to enhance the fisheries values as well as mitigate losses. Testimony was received from the Commissioner of the Maine Department of Inland Fisheries and Game, the Chief of the Marine Resources Branch of the California Department of Fish and Game, and from representatives of several private conservation organizations.

H. R. 11398 (Lipscomb) introduced in the House May 26, 1964, a bill similar to H. R. 2392; referred to the Committee on Merchant Marine and Fisheries.

On June 1, 1964, the Speaker of the House presented a memorial of the Legislature of the State of California memorializing the President and the Congress of the United States relative to anadromous fish; referred to the House Committee on Merchant Marine and Fisheries.

**ANTIDUMPING ACT AMENDMENT:** H. R. 11270 (Ellsworth), H. R. 11284 (Moore), and H. R. 11286 (Nix) introduced in the House May 18, 1964, to amend the Antidumping Act, 1921; also H. R. 11304 (Watson) introduced in the House May 19; H. R. 11347 (Fulton) and H. R. 11359 (McClory) introduced on May 21; and H. R. 11441 (Tollefson) introduced on May 28; all were referred to the Committee on Ways and Means. Similar or identical to bills previously introduced.

**CHEMICAL PESTICIDES COORDINATION:** On June 2, 1964, the Senate Committee on Commerce reported favorably, with amendments, S. 1251 (S. Rept. No. 1053), which amends the act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife by the use of insecticides, herbicides, fungicides, and pesticides. The bill as reported "turns out to be more or less a Committee bill."

S. Rept. No. 1053, **Protection of Fish and Wildlife from Pesticides** (June 2, 1964, report from the Committee on Commerce, United States Senate, 88th Congress, 2nd Session, to accompany S. 1251), 28 pp., printed. The Committee reported the bill with amendments and recommended passage. Contains purpose of the bill, need for the bill, Committee consideration of the bill, agency comments, changes in existing law, and an appendix of notices.

**COMMERCIAL FISHERIES FUND:** On May 20, 1964, the President signed into law S. 627, an act to promote State commercial fishery research and development projects, and for other purposes--P. L. 88-309. The Act authorizes the Secretary of the Interior to cooperate with the States through their respective State agencies in carrying out projects designed for the research and development of the commercial fisheries resources of the Nation.

**CONSERVATION OF MARINE FISHERIES RESOURCES:** On May 20, 1964, the President signed into law S. 1988, an act to prohibit fishing in the territorial waters of the United States and in certain other areas by vessels other than vessels of the United States and by persons other than United States nationals or in-

habitants--P. L. 88-308. In signing the bill the President issued the following statement: "This law fills a long-standing need for legislation to prevent foreign fishing vessels, which in recent years have appeared off our coast in increasing numbers, from fishing in our territorial waters. The new law will not establish any new rights to the continental shelf. But it will make possible the enforcement of whatever rights that now exist or may be established. Since the waters over the continental shelf are high seas, efforts will be made to work out in advance with foreign countries procedures for enforcement there. In this connection, the United States has assured Japan that in such consultations with Japan full consideration will be given to Japan's long-established king crab fishery."

Senator Bartlett on June 5, 1964, spoke from the floor of the Senate concerning the presence of Soviet fishing fleets off U.S. shores. He also inserted an article, "Big Soviet Fleet Reported Fishing in Waters off Mexico," which was published in the Mexico News of May 29. (Congressional Record, pages 12385-12386.)

**CONSUMER PROTECTION:** On June 3, 1964, Congressman Dingell under extension of remarks inserted in that day's Congressional Record (pages A2977-2978) portions of an address given by the Assistant Attorney General in charge of the Antitrust Division of the Department of Justice, delivered before the Conference on the Government's Role in Consumer Protection at the University of Toledo, on April 24, 1964, regarding the Government's role in consumer protection as viewed from the executive-judicial perspective.

**FEDERAL PESTICIDES CONTROL ACT OF 1964:** On May 26, 1964, the House Committee on Agriculture held a hearing on operation of pesticide laws and regulations. Testimony was heard from representatives of three Government agencies.

**FOOD MARKETING NATIONAL COMMISSION:** Study of Food Marketing (Hearings before the Committee on Commerce, United States Senate, 88th Congress, 2nd Session), Part I, 126 pp., and Part II, 196 pp., printed. Contains hearings held March 23, 24, 25, and April 8, 13, 16, 22, 23, 29, and 30, 1964, on S. J. Res. 71, and S. J. Res. 71, as amended. Included are statements of various Federal and state officials.

**S. Rept. No. 1022, Establishing a National Commission on Food Marketing** (May 12, 1964, report from the Committee on Commerce, United States Senate, 88th Congress, 2nd Session, to accompany S. J. Res. 71, as amended), 18 pp., printed. The Committee reported the resolution with amendments and recommended passage. Contains purpose, background, and need for the resolution, committee amendments, cost, section-by-section analysis, agency reports, memorandum, and changes in existing law.

**H. Rept. 1401, National Commission on Food Marketing** (May 13, 1964, report from the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), 7 pp., printed. The Committee recommended passage (with amendments) of H. J. Res. 977, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer. Contains the purpose of the bill, general statement, hearings, committee amendments, and executive communications.

On May 18, 1964, the Senate (after adopting committee amendments en bloc and 2 floor amendments) passed

S. J. Res. 71, to establish a National Commission on Food Marketing to study the food industry from the producer to the consumer. Descriptive remarks concerning the bill are found in that day's Congressional Record (pages 10822-10828).

On May 21, 1964, the House Committee on Rules deferred action on H. J. Res. 977, a resolution similar to S. J. Res. 71.

On May 26, 1964, the House Committee on Rules granted an open rule on H. J. Res. 977.

On June 4, 1964, the House passed H. J. Res. 977. This passage was subsequently vacated and S. J. Res. 71, a similar resolution, was passed in lieu after being amended to contain the House-passed language. The House insisted on its amendment; requested a conference with the Senate; and appointed conferees. House adopted amendments relating to approval of employees of the Commission by the Commissioner in lieu of the Chairman; also to broaden proposed study to include effectiveness of dissemination of market news; and the effect of imported foods on U.S. producers, processors, and consumers. Rejected an amendment to reduce authorization of Commission to \$500,000 instead of \$1,500,000. H. Res. 737, the rule under which the legislation was considered, had been adopted earlier by a voice vote.

Committees of both houses have approved joint resolutions to establish a National Commission on Food Marketing. Amendments by the House Committee included a reduction in the authorization for funds from \$2.5 million to \$1.5 million and also provided that the Commission's report is to be completed by July 1, 1965, instead of July 1, 1966, and that it will state only conclusions and findings without making legislative recommendations. House amendments also provided that at least three members of the Commission would be required to conduct hearings, and that the powers of the Commission could be exercised only on majority vote. Amendments by the Senate Committee were minor, including one to bring products such as seafood within the scope of the Commission's investigations. The Senate measure, however, would authorize a two-year study without the fund cut authorized by the House Committee. Both measures (H. J. Res. 977 and S. J. Res. 71) provide for a Commission of 15 members. In the proposed legislation, the duties of the Commission are described as follows: "The Commission shall study and appraise the marketing structure of the food industry including the following: (1) the actual changes in the various segments of the food industry; (2) the changes likely to materialize if present trends continue; (3) the kind of food industry that would assure efficiency of production, assembly, processing and distribution, provide appropriate services to consumers, and yet maintain acceptable competitive alternatives of procurement and sale in all segments of the industry from producer to consumer; (4) the changes in statutes or public policy, the organization of farming and food assembly, processing, and distribution, and interrelationships between segments of the food industry which would be appropriate to achieve a desired distribution of power as well as desired levels of efficiency; and (5) the effectiveness of the services and regulatory activities of the Federal Government in terms of present and probable developments in the industry."

On June 5, 1964, the Senate disagreed to House amendment to S. J. Res. 71. The Senate then agreed to hold conference requested by House, and appointed conferees.

**GREAT LAKES FISHERIES:** On May 19, 1964, Congressman Cederberg and Congressman Chamberlain, under extension of remarks, inserted in that day's Congressional Record (pages A2600 and A2641) a resolution adopted by the Legislature of the State of Michigan urging Congress to speed the proposed financial assistance to the Great Lakes fishing industry and further urging that an inspection system with respect to fresh-water fish imported from Canada be instituted.

**INTERNATIONAL CONVENTION FOR THE NORTH-WEST ATLANTIC FISHERIES:** On June 1, 1964, the Senate Committee on Foreign Relations submitted to the Senate a favorable report on Executive B, Protocol to the International Convention for the Northwest Atlantic Fisheries (signed at Washington, February 8, 1949), which protocol relates to harp and hood seals and was signed July 15, 1963 (Ex. Rept. No. 8). Ratification of the Protocol by the Senate would indicate the approval of the United States in bringing those species within the responsibility of the Northwest Atlantic Fisheries Commission. (The principal commercial fishery for harp and hood seals is conducted on the ice of the Gulf of St. Lawrence and east of Newfoundland in early spring. Four parties to the Convention presently engage in the fishery: Canada, Denmark, Norway, and the Soviet Union.)

**INTERNATIONAL FOOD STANDARDS:** On June 2, 1964, Senator Anderson inserted in that day's Congressional Record (pages A2924-2926) an address by the Chairman of the U. S. Food and Agriculture Organization Interagency Subcommittee on Codex Alimentarius to the Institute of Food Technologists (24th annual meeting) May 25, Washington, D. C., on "A New Vital Influence in International Food Standards." The Senator in introducing the insertion of the address said: "... the United States, in cooperation with the Food and Agriculture Organization and the World Health Organization, is participating very actively in creating a system of international food standards. New food technology, development of trade areas through the world, and improved transportation have accelerated the need for such a body of food standards. . . ."

**MEDICAL CARE FOR VESSEL OWNERS:** On June 4, 1964, the House Committee on Interstate and Foreign Commerce met in executive session and ordered reported favorably to the House H. R. 3873. (H. Rept. No. 1467) to amend session 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service. It appears that the Committee reported this House bill in lieu of the Senate-passed S. 978. The House bill is similar but not identical with the Senate bill. Under the terms of H. R. 3873 the medical service privileges would be extended to "Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels, on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations."

H. Rept. No. 1467, Medical Care for Fishing Boat Owners (June 9, 1964, Report from the Committee on Interstate and Foreign Commerce, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 3873), 14 pp., printed. The Committee reported

the bill without amendments and recommended passage. Contains purpose, provisions, and cost of the bill; agency reports; and changes in existing law.

**NATIONAL OCEANOGRAPHY AGENCY:** On May 19, 1964, Congressman Wilson under extension of remarks inserted in the Congressional Record (page A2607) an article from Undersea Technology entitled "Centralizing Oceanography."

**NORTH PACIFIC FISHERIES RESOURCES:** On June 2, 1964, Congressman Pelly inserted in that day's Congressional Record (page A2931) extension of remarks concerning a resolution adopted May 20, 1964, by the Ballard Exchange Club of Seattle, Wash., on protection of North Pacific fisheries. The Congressman remarked that this resolution indicates public concern over the adverse impact the Japanese and Soviet fishing fleets are having on North Pacific fisheries resources.

**OCEANOGRAPHIC LEGAL PROBLEMS:** H. R. 11419 (Lennon) introduced in the House on May 27, 1964, a bill authorizing the appropriation of \$50,000 for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds; referred to the Committee on Merchant Marine and Fisheries.

**RESEARCH PROGRAMS:** On May 19 and 20, 1964, the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics held hearings on geographical distribution and indirect costs of Federal research and development. Testimony was given by public witnesses.

**STATE DEPARTMENT APPROPRIATIONS FY 1965:** On May 25, 1964, the Subcommittee of the Senate Committee on Appropriations continued hearings on H. R. 11134, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year ending June 30, 1965. Testimony was given by several Federal officials. Included are funds for the International Fisheries Commission.

**SUPPLEMENTAL APPROPRIATIONS FY 1964:** On May 8, 1964, the Committee on Appropriations reported (H. Rept. 1386) to the House H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, and for other purposes. The bill passed the House on May 11. The Senate received the House-passed bill on May 12. Bill reported (S. Rept. 1030) in Senate May 27 by the Committee on Appropriations. On May 28 after adopting Committee amendments en bloc and a technical amendment by Senator Pastore, the Senate, by unanimous consent, passed H. R. 11201, making deficiency appropriations for fiscal year 1964. As passed by the Senate, the bill would provide the sum of \$46,570,000 for items relating to Alaskan earthquake damage, which sum includes \$650,000 for repair and rehabilitation of Bureau of Commercial Fisheries facilities and equipment replacement; \$17,000,000 for extension of transitional grants to Alaska to assist the State in recovering from the earthquake effects; and \$150,000 for the necessary expenses of the Federal Reconstruction and Development Planning Commission for Alaska. The Senate insisted on its amendments, asked for conference with the House, and appointed conferees.

On June 2, 1964, the House disagreed to Senate amendments to H. R. 11201, and agreed to the conference

requested by the Senate. House also appointed conferees and scheduled a meeting for June 3.

On June 3, 1964, the House and Senate conferees in executive session agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 11201 (H. Rept. 1457). As approved by the conferees, the bill would provide a total of \$1,336,687,143. The Senate version of the bill provided a total of \$1,349,637,143, and the House-passed figure was \$1,264,913,689.

On June 4, 1964, the House adopted the conference report on H. R. 11201, and sent the legislation to the Senate. The Senate adopted conference report on H. R. 11201 on the same day, concurring in certain House amendments to Senate amendments. This cleared the legislation for the President's signature. As approved by both Houses, the bill still provides \$650,000 for the Bureau of Commercial Fisheries for construction relating to the Alaskan earthquake disaster.

Deficiency Appropriations for 1964 (Hearings before the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), 266 pp., printed. Contains hearings held on H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, and for other purposes.

H. Rept. No. 1386, Deficiency Appropriation Bill, 1964 (May 8, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 11201), 28 pp., printed. The Committee submitted the report in explanation of the deficiency appropriations in H. R. 11201. Contains scope and summary of the bill. Included is a table summarizing the budget estimates and amounts recommended in the bill.

S. Rept. No. 1030, Deficiency Appropriation Bill, 1964 (May 27, 1964, report from the Committee on Appro-

priations, United States Senate, 88th Congress, 2nd Session, to accompany H. R. 11201), 35 pp., printed. The Committee reported the bill with various amendments. Contains additional appropriations for various Government agencies.

H. Rept. No. 1457, Deficiency Appropriation Bill, 1964 (June 3, 1964, report from the Committee of Conference, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 11201), 5 pp., printed. The Committee agreed to recommend various agreements to the House and Senate.

On June 9, 1964, the President signed into law H. R. 11201 making deficiency appropriations for fiscal year 1964.

TRADE NEGOTIATIONS: On June 3, 1964, Senator Javits spoke from the floor of the Senate (Congressional Record, pages 12197-12200) and on June 14, Congressman Curtis made a statement under an extension of remarks (Congressional Record, pages A3263-3265) concerning the forthcoming trade negotiations in Geneva under the General Agreement on Tariffs and Trade. Senator Javits and Congressman Curtis both inserted in the Congressional Record, a newspaper article titled "Free Trade Hurdles--Multitude of Non-tariff Obstacles to Imports Troubles GATT Talks--France Rejects Unsatisfactory U. S. Pork; Europe Fumes at Buy American Policies--Undercutting Geneva Gains?"

UNITED STATES FISHING INDUSTRY: On May 21, 1964, Senator Kennedy spoke from the floor of the Senate and inserted in the Congressional Record (pages 11166-11170) excerpts from a speech ("A New Thrust for American Fisheries") given by Under Secretary of the Interior James K. Carr at the National Fisheries Institute Convention held in Seattle April 24-28, 1964.



### UNDERWATER INTERCOM PERMITS SKIN DIVERS TO TALK

In the short history of skin diving as a popular sport, one of the major bottlenecks has been underwater communication which traditionally has been carried out with sign language of the most difficult type. Now they have developed an effective intercom system that works underwater called "Watercom." The new system consists of a special face mask, a throat mike, and a 5-pound cylindrical transmitter strapped to the diver's air tank. Spoken words are picked up by the throat mike, carried to the transmitter on the air tank, amplified, and broadcast into the water so any diver within 100 yards can hear the speaker without any special receiving equipment to bother with.

--By John L. Russell, Jr.  
The Aquarium, May 1964.



# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SSR - FISH - SPECIAL SCIENTIFIC REPORTS - FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title   |
|----------|---|
| CFS-3291 | - Middle Atlantic Fisheries, 1962, Annual Summary (Revised), 6 pp.  |
| CFS-3417 | - FishSticks and Fish Portions, 1963 Annual Summary, 3 pp.  |
| CFS-3442 | - Gulf Coast Shrimp Data, September 1963, 22 pp.  |
| CFS-3459 | - Gulf Coast Shrimp Data, October 1963, 23 pp.  |
| CFS-3460 | - Massachusetts Landings, July 1963, 9 pp.  |
| CFS-3462 | - Georgia Landings, February 1964, 3 pp.  |
| CFS-3463 | - North Carolina Landings, February 1964, 4 pp.   |
| CFS-3465 | - Massachusetts Landings, August 1963, 9 pp.  |
| CFS-3466 | - South Carolina Landings, February 1964, 3 pp.   |
| CFS-3467 | - Oregon Landings, 1963 Annual Summary, 2 pp.   |
| CFS-3469 | - California Landings, January 1964, 4 pp.  |
| CFS-3470 | - Frozen Fish Report, March 1964 (Preliminary), 2 pp.   |
| CFS-3471 | - United States Fisheries, 1962 Annual Summary, 16 pp.  |
| CFS-3472 | - Massachusetts Landings, September 1963, 9 pp.   |
| CFS-3473 | - Gulf Coast Shrimp Data, November 1963, 22 pp.   |
| CFS-3474 | - Maine Landings, 1963 Annual Summary (by months), 7 pp.  |
| CFS-3479 | - Shrimp Landings, November 1963, 8 pp.   |
| CFS-3482 | - Maine Landings, January 1964, 4 pp.   |
| CFS-3485 | - Massachusetts Landings, October 1963, 9 pp.   |
| CFS-3486 | - Massachusetts Landings, November 1963, 9 pp.  |
| CFS-3488 | - Maryland Landings, February 1964, 3 pp.   |
| CFS-3497 | - Maine Landings, February 1964, 4 pp.  |
| CFS-3501 | - Breaded Shrimp, January-March 1964, 2 pp.   |
| CFS-3500 | - Fisheries of the United States, 1963 (A Preliminary Review), 79 pp., illus., April 1964. Contains detailed information on the United States catch of fish and shellfish, production of manufactured fishery products, and foreign trade in fishery commodities. Data contained in the report reveal |

that the catch in 1963 amounted to 4,750 million pounds valued at \$378 million ex-vessel. Of the catch, 2,490 million pounds were used for human food while the remainder was used for the manufacture of industrial products and for bait and animal food. In 1963, for the first time, over half of the U.S. supply of fishery products available was imported--6,500 million pounds, representing 58 percent of the total. A new high was reached in shrimp supplies with 318 million pounds available, in contrast to only 272 million pounds in 1962. The menhaden catch of 1,800 million pounds accounted for 37 percent of the total U.S. catch of all species. Shrimp was the most valuable item (\$70 million) taken, with Pacific salmon running second. The new long-line fishery, principally for Atlantic swordfish, took 2.7 million pounds in comparison to 1.7 million pounds in 1962. During 1963, a considerable migration of the Gulf and South Atlantic shrimp fleet to central and South American countries occurred.

Sep. No. 704 - Shrimp Explorations off Vancouver Island (British Columbia), October-November 1962.

SSR-Fish, No. 469 - Success of Pink Salmon Spawning Relative to Size of Spawning Bed Materials, by William J. McNeil and W. H. Ahnell, 20 pp., illus., January 1964.

SSR-Fish, No. 470 - The Segregation of Red Salmon in the Escapements to the Kvichak River System, Alaska, by Howard Donald Smith, 25 pp., illus., January 1964.

SSR-Fish, No. 472 - Use of Plant Extracts in Serological Studies of Fish, by Fred M. Utter, George J. Ridgway, and Harold O. Hodgins, 22 pp., illus., February 1964.

Drip Formation in Fish. 1--A Review of Factors Affecting Drip, by David T. Miyauchi, 8 pp. (Reprinted from Fishery Industrial Research, vol. 2, no. 2, December 1963, pp. 13-20.)

Inventory of Oceanographic Data for the Western North Atlantic Ocean and the Gulf of Mexico (oceanographic station data, bathythermograph observations, and sea-surface temperature observations), Circular 176, 41 pp., illus., December 1963. A compilation of charts.

THE FOLLOWING REPRINTS FROM FISHERY BULLETIN, VOL. 63, NO. 1, 1963, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

Abundance, Age, and Fecundity of Shad, York River, Va., 1953-59, by Paul R. Nichols and William H. Massmann, pp. 179-187, illus., printed.

Age, Growth, and Maturity of Round Whitefish of the Apostle Islands and Isle Royale Regions, Lake Superior, by Merryll M. Bailey, pp. 63-75, illus., printed.

Age and Growth of the Whitefish in Lake Superior, by William R. Dryer, pp. 77-95, illus., printed.

Cod Groups in the New England Area, by John P. Wise, pp. 189-203, illus., printed.

Comparison of Growth of Four Strains of Oysters Raised in Taylors Pond, Chatham, Mass., by William N. Shaw and James A. McCann, pp. 11-17, illus., printed.

Development of a Mathematical Relationship between Electric-Field Parameters and the Electrical Characteristics of Fish, by Gerald E. Monan and Derek E. Engstrom, pp. 123-136, illus., printed.

Distinguishing Tuna Species by Immunochemical Methods, by George J. Ridgway, pp. 205-211, illus., printed.

Early Larval Stages of the Sea, XIPHOPNEUS KROYERI (Heller), by William C. Renfro and Harry L. Cook, pp. 165-177, illus., printed.

Effect of Fishway Slope on Performance and Biochemistry of Salmonids, by Gerald E. Collins and others, pp. 221-253, illus., printed.

Further Studies on Fishway Slope and Its Effect on Rate of Passage of Salmonids, by Joseph R. Gauley and Clark S. Thompson, pp. 45-62, illus., printed.

Herring Tagging Experiments in Southeastern Alaska, by Bernard Einar Skud, pp. 19-32, illus., printed.

Identification of New England Yellowtail Flounder Groups, by Fred E. Lux, pp. 1-10, illus., printed.

Influence of Water Velocity upon Orientation and Performance of Adult Migrating Salmonids, by Charles R. Weaver, pp. 97-121, illus., printed.

Some Aspects of the Oceanography of Little Port Walter Estuary, Baranof Island, Alaska, by Charles F. Powers, pp. 143-164, illus., printed.

Theory on Development of Mounds Near Red Bluff, Calif., by Harold A. Gangmark and F. Bruce Sanford, pp. 213-220, illus., printed.

Use of Plant Hemagglutinins in Serological Studies of Clupeoid Fishes, by Carl Sindermann, pp. 137-141, illus., printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

Number	Title
MNL - 7	Mexican Fisheries, 1961-63, and First Quarter 1964, 6 pp.
MNL - 23	Fisheries of Chile, Part II and Part III - Central and South Chile, 1960-1962, 18 pp.

MNL-14 - United Kingdom's Fishing Industry, 1959-1963, 40 pp.

MNL-32 - Venezuelan Commercial Catch, Foreign Trade, and Major Developments for 1961-1962, 17 pp.

MNL-89 - Peru: Fish Meal and Oil Report, 1963, 8 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, BOX 3930, HONOLULU, HAWAII 96812.

On the hydrographic condition accelerating the skip-jack's northward movement across the Kuroshio Front, by Hideo Kawai and Minoru Sasaki, 22 pp., illus., processed, June 1963, limited distribution. (Translated from the Japanese, Bulletin of Tohoku Regional Fisheries Research Laboratory, no. 20, March 1962, pp. 1-27.)

Methods of identification for the young stages of tunas and spearfishes. II, by Shoji Ueyanagi and Hisaya Watanabe, 20 pp., illus., processed, April 1964, limited distribution. (Translated from the Japanese, Materials for the Tuna Fisheries Research Council, Nankai Regional Fisheries Research Laboratory, February 1964.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIAL OFFICE MENTIONED.

California Fisheries, 1963, by V. J. Samson, 47 pp., illus., April 1964. (Market News Service, U. S. Fish and Wildlife Service, Rm. 205, Post Office Bldg., San Pedro, Calif. 90731.) A review of 1963 trends and conditions in the California fisheries, including a summary of the sardine fishery during the 1963/64 season when landings were the lowest on record. Among the subjects discussed are the tuna industry and cannery receipts; ex-vessel tuna prices; canned tuna pack; and imports of canned and frozen tuna. Also covered are the fishing fleet developments; the anchovy fishery; and fish meal prices and markets. Included in the statistical tables are data on tuna and tunalike fish--canneries' receipts, domestic landings, frozen imported tuna, and canned pack, 1961-63; sardine landings, pack, and meal and oil produced, 1962/63 and 1963/64 seasons; and the cannery's receipts and pack of mackerel and jack mackerel, 1961-63. Also contains data on cannery's receipts of raw materials and production of anchovies, herring, squid, and pet food; landings of fish and shellfish in the Eureka and San Pedro-Monica areas; imports of fishery products into Arizona and California Customs Districts, 1962-63; and whale fishery, 1961-63. An attractive cover showing the fishermen's Fiesta Time at the Port of Los Angeles enhances this year's report.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, March 1964, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts, of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, April 1964, 9 pp., illus.

(U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego 6, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Fishery Industrial Research, vol. 2, no. 2, December 1963, 88 pp., illus., processed. (Branch of Reports, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240.) This is the third issue of a new periodical which is being published irregularly and which presents papers devoted to research on problems of the fishing industry. This issue has: "Economic Factors Related to Lake Trout Quotas on Lake Superior, by Keith D. Brouillard;" "Effect of Storage in Refrigerated Sea Water on Amino Acids and Other Components of Whiting (*Merluccius bilinearis*)," by Edward H. Cohen and John A. Peters;" "Drip Formation in Fish, I--A Review of Factors Affecting Drip," by David T. Miyauchi;" "Storage of Fish in Refrigerated Sea Water," by Edward H. Cohen and John A. Peters;" "Technological Investigations of Pond-Reared Fish, I--Product Development from Buffalo," by Leo J. Sullivan and Harry L. Seagran; and "Bibliography of Publications--Division of Industrial Research, by Branch, Year, and Author, 1955-1961 Inclusive," by Virginia Whorley.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, February and March 1964, 12 pp. each. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf Menhaden Landings and Production of Meal, Solubles, and Oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1964, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, March 1964, 22 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and

Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--March 1964, 19 pp. (Market News Service, U.S. Fish and Wildlife Service, 155 John St., New York, N.Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; U.S. shrimp supply indicators; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1964, 7 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDING OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402.

Anglers' Guide to Sharks of the Northeastern United States, Maine to Chesapeake Bay, by John G. Casey, Circular 179, 34 pp., illus., printed, April 1964, 25 cents.

"Comparison of Various Methods of Hemoglobin Determination on Catfish Blood," by Howard N. Larsen, article, *The Progressive Fish-Culturist*, vol. 26, no. 1, January 1964, pp. 11-15, illus., processed, single copy 25 cents.

"Dry Concentrates as Complete Trout Foods," by Arthur M. Phillips, Jr., Glen L. Hammer, and Earl A. Pyle, article, *The Progressive Fish-Culturist*, vol. 26, no. 1, January 1964, pp. 21-24, processed, single copy 25 cents.

"An Experimental Sea Lamprey Barrier," by Thomas M. Stauffer, article, *The Progressive Fish-Culturist*, vol. 26, no. 2, April 1964, pp. 80-83, illus., processed, single copy 25 cents.

"A Modified Scoop Trap for Sampling Downstream-Migrant Salmon in Turbid Glacial Rivers," by William R. Meehan, article, *The Progressive Fish-Culturist*, vol. 26, no. 1, January 1964, pp. 42-46, illus., processed, single copy 25 cents.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ALGAE:

"Algae, The Pondowners Scummy Scourge," by H. D. Kelly, article, *Alabama Conservation*, vol. XXXIV, no. 1, December 1963-January 1964, pp. 14-16, illus., printed. Alabama Department of Conservation, 64 N. Union St., Montgomery 4, Ala.

### AMINO ACIDS:

"Fish and Fish Products. Part IV--Evaluation of Certain Important Types of Fish for Their Valuable Constituents and Essential Amino Acids," by M. Qudrat-I-Khuda, Kh. M. Qudusur Rahman, and N. A. Khan, article, *Scientific Researches*, vol. 1, no. 1, January 1964, pp. 49-56, illus., printed. East Regional Laboratories of P.C.S.I.R., Mirpur Rd., Dharmundi, Dacca-2, East Pakistan.

### ANCHOVY:

"Experiencias sobre el Empleo de Anchoveta Fresca (*Engraulis ringens*) en la Alimentación de Cerdos" (Research on the Use of Fresh Anchovy--*Engraulis ringens*--in the Feeding of Hogs), by A. Bacigalupo and others, article, *Anales Científicos*, vol. 1, no. 1, April-May-June 1963, pp. 18-39, illus., printed in Spanish with English summary. Universidad Agraria, Departamento de Publicaciones, Apartado 456, Lima, Peru.

### ANTIBIOTICS:

Problems in the Use of Antibiotic Dips for the Preservation of Fresh Atlantic Groundfish Fillets, by C. H. Castell and Jacqueline Dale, Bulletin No. 138, 70 pp., 1963, printed. Fisheries Research Board of Canada, Ottawa, Canada.

### ANTIOXIDANTS:

"Nutritive Value of Marine Oils. II--Effects of in Vivo Antioxidants in Feeding of Menhaden Oil to Swine," by J. E. Oldfield, R. O. Sinnhuber, and A. A. Rasheed, article, *Journal of the American Oil Chemists' Society*, vol. 40, August 1963, pp. 357-360, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

### ARGENTINA:

"Piscicultura del Pejerrey" (Pond Culture of the Pejerrey), article, *Asuntos Agrarios*, vol. XI, no. 125, January 1964, p. 5, illus., printed in Spanish. Ministerio de Asuntos Agrarios, Departamento de Publicaciones, Av. 51, no. 774, La Plata, Argentina.

### ARTIFICIAL REEFS:

Artificial Habitat in the Marine Environment, by John G. Carlisle, Jr., Charles H. Turner, and Earl E. Ebert, Fish Bulletin 124, 94 pp., illus., printed. Documents Section, Department of Fish and Game, P. O. Box 1612, Sacramento, Calif. 95807. A study of changes, caused by offshore drilling, in the habitat of marine fish dwelling in artificial reefs. Findings showed that those changes were generally beneficial to the fish and plants; and depositing washed drill cuttings on the bottom at those sites was neither deleterious nor beneficial to the marine life in the area.

### BACTERIAL CONTAMINATION:

Coliform Contamination in Lobster Meat Traced to Cooler Construction, by John M. Graham, 3 pp., illus., printed. (Reprinted from *Canadian Fisheries Reports*, no. 2, September 1963, pp. 25-27.) Fish Inspection Laboratory, Department of Fisheries of Canada, Shediac, N. B., Canada.

### BACTERIOLOGY:

"Radiation-Resistant, Pigmented Coccus Isolated from Haddock Tissue," by Norman S. Davis, Gerald J. Silverman, and Edmund B. Masurovsky, article, *Journal of Bacteriology*, vol. 86, August 1963, pp. 294-298, printed. Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

### BALTIC SEA:

Changes in Commercial Fish Stocks in Baltic Sea under Influence of Oceanologic Factors, USSR, by T. F. Dement'yeva, OTS 64-21653, 15 pp., illus., printed, February 26, 1964, 50 cents. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 5, 1963.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20235.

### BARRACUDA:

Systematics and Life History of the Great Barracuda, SPHYRAENA BARRACUDA (Walbaum), by Donald P. DeSylva, Studies in Tropical Oceanography No. 1, 186 pp., illus., printed, October 1963, \$2.50. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149. The great barracuda is found in all tropical seas, with the exception of the eastern Pacific Ocean. Poisoning in humans who have eaten fresh barracuda is due to a toxin in the meat and not from bacterial poisoning. In the western Atlantic, poisonings have occurred throughout the year. There seems to be no relation between attainment of maturity or the spawning cycle and the poisonous nature of the flesh. Evidence is presented in this report for a food-chain origin of the toxin, and mechanisms are discussed for the transmission of the toxin from planktonic and benthic algae to barracuda by way of intermediate organisms. A summary of the 29 attacks reputedly made by these fish on humans is presented and analyzed.

### BELGIUM-LUXEMBOURG:

Foreign Trade Regulations of Belgium-Luxembourg, by Robert H. Walker, OBR 64-26, 12 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Belgium-Luxembourg Economic Union (BLEU) has followed a liberal, outward-looking trade policy, reflecting its heavy dependency on foreign markets and suppliers. Imports have been almost completely liberalized; i.e. admitted without quantitative restrictions, and items still restricted or subject to licensing are for the most part liberally treated. The report discusses trade policy, import tariff system, sales and other internal taxes, documentation, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, BLEU export controls, United States import and export controls, and diplomatic representation between the two countries.

### BIOCHEMISTRY:

Determination of Ammonia Nitrogen in Salted Sardines, by C. Bibic, article, *Chemical Abstracts*, vol.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

58, April 29, 1963, 9558d, printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

Introduction to the Biochemistry of Foods, by J.B.S. Braverman, 351 pp., printed, 1963, 70s. (about US\$9.80). Elsevier Publishing Company, 52 Vanderbilt Ave., New York, N. Y. 10017.

#### BRAZIL:

Relatório do Projeto de Pesca Exploratoria na Costa de Santa Catarina, Janeiro-Fevereiro, 1963 (Report on the Exploratory Fishing Project along the Santa Catarina Coast, January-February 1963), 65 pp., illus., processed, 1964. Seta de Pesquisas, Departamento Estadual de Pesca e Caca e Pesca, Estado de Santa Catarina, Florianópolis, Santa Catarina, Brazil. This is a report on an exploratory fishing project carried out by the State of Santa Catarina Fish and Game Department, with technical assistance from FAO, along the coast of that State in southern Brazil, between latitudes 26° S. and 29°20' S., during January and February 1963. The vessel used was a small research vessel of 15 meters length. The otter trawl used was 12 meters long (with head-line of 24 meters, and footrope of 30 meters), made of cotton, with internal stretched mesh sizes from 10 centimeters in the foreparts to 58 millimeters in the cod end. Species trawled included sea bob, white shrimp (*Penaeus schmitti*), sharks, and flatfish.

#### CANADA:

The Commercial Fisheries of British Columbia, 100 pp., illus., processed, December 1963, Bureau of Economics and Statistics, Department of Industrial Development, Trade, and Commerce, Victoria, B. C., Canada. Provides a general survey of the fishing industry and relates the industry's markets, production, labor force, capital investment, and other expenditures to the provincial economy. The principal emphasis is on the following aspects of the industry rather than on species of fish, areas of catch, or conservation problems: markets; production; capital investment and other expenditures; the labor force; and other aspects of the industry (including international relations and the role of government in the fisheries). While the most current statistics and information available are presented, the principal years surveyed are 1960 and 1958. The general conclusion is that the industry is an important contributor to the provincial economy in terms of employment, production, and investment.

Fisheries Statistics of British Columbia, 1963 (Preliminary), 14 pp., processed, April 1964. Canadian Department of Fisheries, Pacific Area, Economics Branch, 1155 Robson St., Vancouver 5, B. C., Canada. Discusses the total value of fish and fish products produced in 1963 with an analysis of the decrease in market value from the previous year; marketing by species, and landed and market value, 1950-63; canned pack, and production and utilization of salmon; and landings and value of herring and by-products, halibut, soles, crab and shrimp, and other species. Also covers fishing vessels, gear and equipment, and number of licensed fishermen. Includes statistical tables on landings and values by species and by years; landings and manufactured products; salmon pack, 1963; and other similar data.

Fisheries Statistics of Canada 1961 (Canada Summary), vol. 1, part 3A, March 1964, 60 pp., printed in French and English, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. This report provides a summary of the Canadian fisheries, arranged to show separately the three main fisheries--Atlantic, Pacific, and Inland. Also contains statistical tables on landings, quantity, and value by species and provinces; value of exports and imports of fish and fishery products; employment in the primary industry; Canadian lobster pack; British Columbia salmon pack; and fishing bounties paid to vessels and boats.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 2, March 1964, 214 pp., illus., printed, single copy C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, these articles: "Winter Cod Taggings off Cape Breton and on Offshore Nova Scotia Banks, 1959-62," by W. R. Martin and Yves Jean; "Variability in Paper Electrophoretic Patterns of the Serum of Landlocked Sea Lamprey, *Petromyzon marinus* Linnaeus," by M. L. H. Thomas and H. R. McCrimmon; "Structural Homogeneity in Unsaturated Fatty Acids of Marine Lipids. A Review," by R. G. Ackman. "Changes in Glycogen and Lactate Levels in Migrating Salmonid Fishes Ascending Experimental 'Endless' Fishways," by Anne R. Connor and others; "Cod Liver Oil: Component Fatty Acids as Determined by Gas-Liquid Chromatography," by R. G. Ackman and R. D. Burgher; and "Observations on the Milky Condition in Some Pacific Coast Fishes," by Max Patashnik and Herman S. Groninger, Jr.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1963, 26 pp., illus., processed, March 31, 1964. Department of Fisheries of Canada, Pacific Area, 1155 Robson St., Vancouver 5, B. C., Canada.

#### CANNING:

"Canning Fresh-Water Fish. Part 3," by A. W. Lantz, article, Progress Reports of the Biological Station and the Technological Unit, No. 2, May 1961, pp. 37-47, printed. Fisheries Research Board of Canada Technological Unit, Ontario, Canada.

#### CHESAPEAKE BAY:

Chesapeake Science, vol. 4, no. 4, December 1963, 62 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes, among others, these articles: "Monogenetic Trematodes from Some Chesapeake Bay Fishes. Part I--The Superfamily Capsaloidae Price, 1936 and Diclidophoridae Price, 1936," by J. W. McMahon; "Summer Food of Juvenile American Shad in Virginia Waters," by W. H. Massmann; and "Sport Fishing Survey of the Lower Potomac Estuary, 1959-1961," by C. M. Frisbie and D. E. Ritchie, Jr.

#### CHILE:

Foreign Trade Regulations of Chile, by William E. Spruce, OBR 64-23, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A

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report offering information to businessmen interested in export-import trade with Chile. Discusses Chile's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Chile's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### CHLORTETRACYCLINE:

"Method for Chlortetracycline Determination in Fish," by G. B. Dubrova and Yu. I. Rubinstein, Chemical Abstracts, vol. 57, October 29, 1962, 11614e printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### CHOLESTEROL:

"A Comparison of the Effects of the Polyunsaturated Fatty Acids of Cuttlefish Liver Oil and Cottonseed Oil on Cholesterol Metabolism," by T. Kaneda and R. B. Alfin-Slater, article, Journal of the American Oil Chemists' Society, vol. 40, August 1963, pp. 336-338, printed. American Oil Chemists' Society, 35 East Wacker Drive, Chicago 1, Ill.

#### COLOMBIA:

"Cinco Especies de Peces se Han Escogido para una Campaña" (Five Species of Fish Have Been Selected for a Campaign), article, El Tiempo (Bogota), May 1, 1964, p. 34, printed in Spanish. El Tiempo, Bogota, Colombia. (A limited number of copies of a translation are available from Social Projects Department, American Institute for Free Labor Development, 1925 K St. NW., Suite 406, Washington, D. C. 20006.) Discusses the proposed fresh-water fish culture program in Colombia; the five species of both temperate zone and tropical-type fish chosen for culture; and the projected establishment of a Pisciculture Institute at Buga. The purpose of the program is the ultimate establishment of fish ponds throughout Colombia and their production of supplemental protein for the national diet.

#### CUBA:

World Trade with Cuba, 1961-62, OBR 64-41, 4 pp., processed, March 1964, 15 cents. Bureau of International Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This special report presents statistics on free-world and Sino-Soviet bloc trade with Cuba. The statistical tables show: the value of this trade as reported by Cuba's trading partners, 1961-62; a historical series of data through 1960, based on Cuban statistics; and tabulations made from official foreign trade publications of the free-world countries.

#### ECUADOR:

Ecuador Trade Regulations of Ecuador, by Gary D. Adams, OBR 64-28, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Current import policy, although still largely oriented toward revenue collection, is also designed to help stimulate Ecuadorian industry and agriculture, to discourage contraband imports, and to preserve foreign exchange for the importation of items considered essential for national economic well-being. The

report includes information on Ecuador's import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Ecuador's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### EDUCATION:

Bulletin, Institute of Marine Science, University of Miami, 1964-1965, vol. 38, no. 7, February 1964, 30 pp., illus., printed. University of Miami, Coral Gables, Fla. Describes graduate degrees and courses offered in fisheries, marine biology, and oceanography under the Department of Marine Science.

#### ENZYMES:

"Glycolytic Enzymes in the Tissues of a Salmonid Fish (*Salmo gairdnerii gairdnerii*), by Robert A. MacLeod, R. E. E. Jonas, and E. Roberts, article, Canadian Journal of Biochemistry and Physiology, vol. 41, September 1963, pp. 1971-1981, printed. National Research Council, Ottawa 2, Canada.

"Studies on Proteolytic Enzyme of Liver of King Crab, *Paralithodes camtschatica* (Tilesius). I--Isolation of the Crystalline Enzyme," by Tsuneyuki Saito, and others. Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, October 1962, pp. 1015-1019, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### EUROPEAN FREE TRADE ASSOCIATION:

The European Free Trade Association--Today and Tomorrow, 49 pp., illus., printed, January 1964, \$3. McGraw-Hill, Inc., TMIS Annex, 351 W. 41st St., New York, N. Y. In 5 main sections this report examines the development of EFTA; organizational matters; policy; markets and trade patterns in the EFTA area; EFTA and the 1964 Kennedy Round of tariff negotiations; and other matters essential to an understanding of the Association.

#### FARM PONDS:

"Use and Value of Farm Ponds," article, The Tennessee Conservationist, vol. XXX, no. 4, April 1964, pp. 14, 22, illus., printed. The Tennessee Conservationist, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville Tenn. A fishpond can be a delightful part of a farm, according to the author. A good pond makes use of the land; provides water for livestock, fire protection, and recreation; and when properly managed it can be an extra source of income to the owners.

#### FATTY ACIDS:

"Incorporation of Linolenic-1,4 Acid into Eicosapentaenoic and Docosahexaenoic Acids in Fish," by Mitsuo Kayama, and others, article, Journal of the American Oil Chemists' Society, vol. 40, September 1963, pp. 499-502, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

"A Study of the Hypocholesterolemic Activity of the Ethyl Esters of the Polyunsaturated Fatty Acids of Cod Liver Oil in the Chicken. I--Effect on Total Serum Cholesterol; II--Effect on Serum and Tissue Cholesterol and Aortic and Coronary Atherosclerosis," by Samuel G. Kahn and others, article, Journal of Nutrition, vol. 80, August 1963, pp. 403-413.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

printed, American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

#### FEDERAL REGULATIONS:

Cumulative Pocket Supplement to Code of Federal Regulations, Title 50, Wildlife and Fisheries (as of January 1, 1964), 126 pp., printed, 1964, 50 cents. Federal Register Office, General Services Administration, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

#### FISH BEHAVIOR:

"The Schooling of Fishes," by E. Shaw, article, *Scientific American*, vol. 206, no. 6, 1962, pp. 128-134, 137-138, printed, Scientific American Inc. 415 Madison Ave., New York 17, N.Y.

#### FISH BLOOD:

"Studies on the Auto-Oxidation Velocity of Fish Myoglobin," by Fumio Matsuura, and others, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, February 1962, pp. 201-216, printed, Japanese Society of Scientific Fisheries, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

#### FISHERY REGULATION:

"Optimization and Suboptimization in Fishery Regulation," by Ralph Turvey, article, *The American Economic Review*, vol. LIV, no. 2, Part I, March 1964, pp. 64-76, illus., printed, single copy \$2. The American Economic Review, Stanford University, Stanford, Calif. 94305. The purpose of this article is to show that fishery regulation is one of those spheres of economic policy where what is the best thing to do depends on what can be done. This is usually illustrated by the analogy that, if one wants to climb as high as possible but cannot climb all the way up the highest mountain, the best thing to do may be to walk in the opposite direction and climb to the top of a lower one. If the highest mountain is to be climbed, then regulation must extend not only to the scope of the problem but to the mode of operation as well.

#### FISHERY RESEARCH:

*Research in Fisheries, 1963*, edited by Ted S. Y. Koo, Contribution No. 166, 79 pp., illus., printed, March 1964. Research in Fisheries, University of Washington, Fisheries Center, Seattle, Wash. 98105. Presents papers on Alaska salmon studies, other fish projects, ecology and taxonomy, shellfish, food science, and related subjects.

#### FISH FAT:

"On the Structure of the Depot Fats of Marine Fish and Mammals," by H. Brockerhoff and R. J. Hoyle, article, *Archives of Biochemistry and Biophysics*, vol. 102, September 1963, pp. 452-455, printed, Academic Press Inc. 111 Fifth Ave., New York 3, N.Y.

#### FISH FOOD:

"Revolution in Fish Diets," by Keen Buss, article, *The Aquarium*, vol. 33, no. 5, May 1964, pp. 16-17, printed, single copy 40 cents. The Aquarium Publishing Co., Box 832, Norristown, Pa. 19044.

#### FISH MEAL:

*Azetotropic Method of Obtaining Fish Meal*, USSR, by Yu. S. Davydova, OTS 64-21691, 10 pp., printed, February 29, 1964, 50 cents. (Translated from the Russian, *Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaystva i Okeanografii*, vol. 45, 1962.) Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20235.

ruary 29, 1964, 50 cents. (Translated from the Russian, *Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaystva i Okeanografii*, vol. 45, 1962.) Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20235.

#### FISH MUSCLE:

"Studies on Bound Water in Fish Muscle," by Minoru Akiba, article, *Memoirs of the Faculty of Fisheries*, vol. 9, no. 2, 1961, pp. 85-179, printed, Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### FISH OILS:

"The Oxidation of a Highly Unsaturated Herring Oil," by Harald Astrup, article, *Chemistry and Industry*, January 18, 1964, pp. 107-108, printed, Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

#### FREEZING:

"Air Blast Freezing of Kippers," by J. Graham and J. H. Merritt, article, *Modern Refrigeration*, vol. 66, September 1963, pp. 837-840, 862, printed, Refrigeration Press Ltd, Maclaren House, 131 Great Suffolk Street, London, SE1, England.

#### FUR SEALS:

"The Return of the Antarctic Fur Seal," by Fergus O'Gorman, article, *New Scientist*, vol. 20, no. 365, November 14, 1963, pp. 374-376, illus., printed, single copy 1s. (about 15 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. The Antarctic fur seal's reappearance on the South Georgia, South Orkney, South Shetland, and South Sandwich Islands provides an example of a population recovery, since the species was almost wiped out by sealers in the last century. Today, there are at least 20,000 individuals on one island and they will doubtless be harvested again--after scientific study.

#### GAR:

"The Longnose Gar," by Norvel Netsch, article, *The Tennessee Conservationist*, vol. XXX, no. 4, April 1964, pp. 14, 22, illus., printed, The Tennessee Conservationist, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville, Tenn.

#### GEAR:

"Shock Absorber for Driftnet Warp," by V. B. Fershtman, article, *Rybnoe Khozyaystvo*, vol. 38, no. 2, 1962, pp. 36-42, printed in Russian. V. Krasnosel'skaia 17, Moscow, U.S.S.R.

#### GERMAN FEDERAL REPUBLIC:

*Informationen für die Fischwirtschaft*, vol. 10, no. 6, 1963, 39 pp., illus., processed in German. Bundesforschungsanstalt für Fischerei, Hamburg-Altona 1, Palmallee 9, Germany. Contains, among others, these articles: "FFS 'Walther Herwig' von Erster Forschungsfahrt Zurück" (The Walther Herwig Has Just Returned from Her First Research Trip); "Fischerei auf den Bankhering in der Nordsee 1963" (Fisheries of Bank-Herring in the North Sea in 1963); "Heringsfischerei der USSR in der Nordsee" (Herring Fisheries of the U.S.S.R. in the North Sea); and "Die Thunfischerei in Deutscher Sicht" (German Outlook on Tuna Fishery).

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## GHANA:

Establishing a Business in Ghana, by Evelyn M. Schwartztrauber, OBR 64-T2, 8 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report of help to businessmen considering an investment in Ghanaian industry. The Capital Investments Act 1963 aims to encourage foreign private investment by providing incentives, such as tax exemptions, and by guaranteeing the repatriation of profits and capital. The report discusses government policy on private foreign investment; entry, remittance, and repatriation of capital; and trade factors--tariff and trade concessions, and advantage of location in Ghana. Also covers business organization, laws and regulations affecting employment, and cost factors.

## GULF AND CARIBBEAN:

Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 1, March 1964, 187 pp., illus., printed, single copy \$2. University of Miami Press, Coral Gables, Fla. Includes, among others, article on: "Observations on Burrowing Behavior of the Pink Shrimp, *Penaeus duorarum*, Burkenroad," by Charles M. Fuss; "Single File Migration of the Spiny Lobster, *Panulirus argus* (Latreille)," by William F. Herrnkind and William C. Cummings; and "Enoplo-teuthis anapsis, a New Species of Enoploteuthid Squid (Cephalopoda: Oegopsida) from the Atlantic Ocean," by Clyde F. E. Roper.

## HONDURAS:

Foreign Trade Regulations of Honduras, OBR 64-21, 8 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.) Present Honduran trade policy is intended to implement the Central American Common Market agreements. Although these agreements tend to be restrictive compared to past Honduran trade policy, simplified procedures and an expanding Central American market may make the overall trade picture favorable for U. S. exports. The report includes information on the Honduran system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Honduras' export controls, United States foreign trade controls, and diplomatic representation between the two countries.

## INDIA:

The Wealth of India. Raw Materials 4. Supplement: Fish and Fisheries, 132 pp., printed, 1962. Council of Scientific and Industrial Research, New Delhi, India.

## INTERNATIONAL FISHERIES CONVENTION:

International Fisheries Convention of 1946. The Permanent Commission. Report by the President on the Eleventh Meeting, 29 pp., processed in French and English, 1964. Office of the Permanent Commission, Rm. 620, East Block, Whitehall Pl., London SW1, England. Includes a report by the President on the Eleventh Meeting of the Permanent Commission, held in London, May 1963; a list of names of dele-

gates, advisors, and observers attending the meeting; and the agenda. Also presents a report by the Finance Committee; and a press notice issued after the Eleventh Meeting.

## ISRAEL:

Foreign Trade Regulations of Israel, OBR 64-30, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Israel uses its trade policy to further its developing economy by assigning the highest priority to imports of foods, industrial raw materials, machinery, and such other products as are considered economic necessities. The report discusses Israel's import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Israel's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

## ITALY:

Bollettino di Pesca, Piscicoltura e Idrobiologia, vol. XVII, no. 2, July-December 1962, 133 pp., illus., printed in Italian with French and English summaries, single copy L. 600 (about 95 U. S. cents). Laboratorio Centrale di Idrobiologia, Piazza Borghese, 91, Rome, Italy. Contains, among others, article on: "Studi sulla Biologia e Pesca di *Xiphias gladius* L." (Study on Biology and Fishery of Swordfish, *Xiphias gladius* L.), by Antonino Gavaliere; "Osservazioni sul Ritmo di Accrescimento e sullo Sviluppo di Popolazioni di Trota (*Salmo trutta fario* L.)" (Observation on the Rate of Increase and Its Influence on the Population of Trout--*Salmo trutta fario* L.) and "Esperimenti di Allevamento di Trota Marmorata (*Salmo marmoratus* Cuv.)" (Experiment in Rearing Marmorata Trout--*Salmo marmoratus* Cuv.).

## JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 2, August 1963, 86 pp., illus., printed in Japanese with English abstracts and tables. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Includes, among others, articles on: "Larvae and Young of the Whiting, *Theragra chalcogramma* (Pallas) from the North Pacific," by K. Kobayashi; "Freeze Vacuum Drying of Marine Products. I," by K. Kobayashi and S. Igarashi; "Studies on Air Screen in Water. II-(1)," by S. Igarashi; "Lipids of Plounder. III; IV," by H. Igarashi and others; "Studies on Spoilage of Fish Sausage. I; II," by E. Tanikawa, T. Motohiro, and M. Akiba.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 3, November 1963, 76 pp., illus., printed in English except as noted. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Presents, among others, article on: "The Normal Developmental Stages of the Pond Smelt, *Hyposues olidus* (Pallas)," by Juro Yamada; "Photosynthesis of a Natural Phytoplankton Population Mainly Composed of a Cold Diatom, *Thalassiosira hyalina*, in Hakodate Harbor, March 1962," by Shigeru Motoda and others; "On the Effects of Environmental Factors upon the Reproduction of Fishes," by Hiroshi Yoshioka; "Devices of Simple Plankton Apparatus. II,"

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by Sigeru Motoda; "Freeze Vacuum Drying of Marine Products. II," by Kiichiro Kobayashi and Shuzo Igarashi (in Japanese with English abstract); "Studies on Complete Utilization of Squid (*Onnastrephes sloan pacificus*). XIX," by Eiichi Tanikawa, Akiba Minoru, and Terushige Motohiro (Japanese with English abstract); "Likes and Dislikes of Fish Meat. Part 1-By Some Americans," by Keiichi Oishi and Ayako Okumura (Japanese with English abstract).

Kaigai Gyogyo (Overseas Fisheries), no. 16, 1964, 51 pp., illus., printed in Japanese. International Fisheries Co-Operative Organization, 3 Banchi, 2 Chome, Saiwai-cho, Chiyoda-ku, Tokyo, Japan. Includes the following articles: "Establishment of an Overseas Fisheries Policy," by K. Nakatani; "International Problems Facing the Tuna Industry," by A. Takashiba; "A Visit to the Cook Islands," by N. Sumida; "Present Condition of Overseas Fisheries;" "Overseas Advancement of the Japanese Coastal and Off-shore Fisheries," by Y. Ikeda; "Foreign Private Capital Investment Structure of Developing Nations;" and "Tanganyika Fisheries Survey Report."

Yearbook of Fisheries--1963, No. 10, 910 pp., illus., printed in Japanese, May 15, 1963, 1,700 yen (about US\$2.) Suisan Sha, 8, San'ei-cho, Shinjuku-ku, Tokyo, Japan. This report covers the period July 1961 through December 1962. Includes sections on fishery legislation and administration; fishery products production--whaling, salmon and trout industries, mothership crab operations, bonito and tuna fishing, the saury fishery, and other important fisheries; and economics of the fishery industries--prices, transportation, consumption, foreign trade, labor, and patents issued. Also covers management--capitalization, cooperatives, unions, and trade associations; and international relations--commissions and conventions, Japan's overseas fisheries, and world fishing industries. Presents many statistical tables showing data on landings of whales, marine and fresh-water fish, and processed products; number of fishermen; quantity of fishery products purchased per family in rural and in urban areas; quantity of exports of fresh and frozen, dried and smoked, and canned fish; amount of capital invested in the fishing industries; and other related information.

#### KOREA:

Bulletin of Fisheries College, Pusan National University, vol. V, no. 1, September 1963, 76 pp., illus., printed in Korean with English abstracts. Fisheries College, Pusan National University, Pusan, Korea. Contains, among others, these articles: "On Some Trematodes Whose Intermediate Hosts are Brackish Water Fishes. II--The Life History of *Pygidiosis summus*, the Intermediate Host of Which is *Mugil cephalus*," by Seh Kyu Chun; "On the Development of a Freshwater Snail, *Parafossarulus manchouricus* Bourguignat;" "Food Preservation by Ionizing Radiations. I--The Combined Effects of Ionizing Radiation and Smoking on Fish Meat Preservation, and III--Preservation of the Dried Laver," by Byung Sun Chung; "On the Preservation of Korean Fish-Cake Products. I--On the Preservative Effects by Food Preservatives," by Wi Kyung Choi; and "An Example of Raising Korean Catfish *Parasilurus asotus* (Linne) in a Small Pond," by In Bae Kim.

#### LOUISIANA:

Louisiana Fishery: The Coastal Marshes, by Larry H. Ogren, Wildlife Education Bulletin No. 35, 7 pp., illus., printed. (Reprinted from Louisiana Conservationist, April 1962.) Louisiana Wildlife and Fisheries Commission, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Discusses estuarine biology and the fishery for brackish-water fish in Louisiana.

#### MARINE ALGAE:

Evaluation of Certain Marine Algal Flagellates for Mass Culture, by Richard W. Eppley, OTS 63-10364, 15 pp., processed, November 1963, \$1.60. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Research on the Chemical Composition and Digestibility of Algal Cell Walls, by Milton J. Becker and Alan M. Sheffner, OTS 63-10066, 28 pp., processed, November 1963, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### MECHANICAL DRYING:

"Drying Fish Quickly Without Cooking It," article, New Scientist, vol. 19, September 5, 1963, p. 490, printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

#### MISCELLANEOUS:

Fisheries as a Profession, 5 pp., processed, September 1, 1963. Division of Salt Water Fisheries, Florida Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla. Discusses briefly the importance of the fishery resource, educational requirements for work in fisheries biology and related fields, and types of work in those fields. Also covers personal requirements, salaries, benefits, and opportunities for employment.

#### NERVOUS SYSTEM:

The following processed reports are for sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230, at 50 cents a copy.

Chemoreception in Crustaceans. Report No. 1: Variability in the Chemoreception of Amphipods (GAMMARUS LOCUSTA and G. LACUSTRIS), by A. N. Zubov, OTS 63-11164, 8 pp., illus., 1963. (Translated from the Russian, Akademiya Nauk SSSR, Trudy Murmanskogo Morskogo Biologicheskogo Instituta, vol. 6, no. 2, 1963, pp. 245-252.)

Role of the Receptors of the Body Surface in the Mechanism of the Reaction of Fish to Electric Currents, by N. V. Bodrova and E. V. Krayukhin, OTS 63-11111, 8 pp., 1963. (Translated from the Russian, Trudy Instituta Biologii Vodokhranilishch, vol. 6, no. 3, 1960, pp. 266-272.)

#### NETHERLANDS:

Foreign Trade Regulations of the Netherlands, by Ann P. Brosnan, OBR 64-31, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

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Because of the importance of foreign trade to the country's economy, the Netherlands has been traditionally in favor of the greatest possible elimination of trade barriers. This report discusses the import tariff system, sales and other internal tax, documentation and fees, and special customs provisions. Also covers nontariff import trade controls, Netherlands' export controls, United States foreign trade controls, and government representation between the two countries.

#### NEVADA:

Fishes and Fisheries of Nevada, by Ira La Rivers, 782 pp., illus., printed, 1962, distribution limited, Nevada Fish and Game Commission, Box 678, Reno, Nev.

#### NORWAY:

Fiskerierne i Norge; Økonomi og Politikk (The Fisheries in Norway; Economics and Politics), by Gerhard Meidell Gerhardsen, 192 pp., illus., printed, 1964, Kr. 38.50 (about US\$5.40), Oslo University Press, Universitetsforlaget, Oslo, Norway. The early chapters of this book cover the background and problems of the Norwegian fisheries; natural resources; fishermen and their equipment; and profitability and regulation of the industry. Later chapters discuss landings and ex-vessel prices; processing and exporting of fish; government fishery institutions and administration; and related information.

#### NUTRITION:

Let the Sea Nourish Your Health, by Earl Ubell, 4 pp., illus., printed, (Reprinted from *House Beautiful*, June 1963.) Hearts Corp., 572 Madison Ave., New York, N. Y. 10022.

#### OCEANOGRAPHY:

Explorers of the Sea. Famous Oceanographic Expeditions, by Muriel L. Guberlet, 234 pp., illus., printed, 1964, \$4.50. Ronald Press, 15 E. 28th St., New York 10, N. Y.

International Indian Ocean Expedition Newsletter, India, no. 3, December 1963, 12 pp., printed. The Indian National Committee on Oceanic Research, Council of Scientific and Industrial Research, B-7, Hauz Khas Enclave, New Delhi-16, India.

National Oceanographic Program, Fiscal Year 1965, ICO Pamphlet No. 15, 54 pp., printed, March 1964. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington, D. C. 20360. Outlines a coordinated plan for the accomplishment of national goals while pursuing individual agency missions. Part I, a summary of the Fiscal Year 1965 National Oceanographic Program, discusses oceanic research to meet National goals; 1965 plans and budgets; interpretation of the 1965 budget; program management; problems and emerging issues; and other related topics. Part II, a review of the Program and its cost, covers oceanographic effort--international oceanographic programs, and National services and facilities in oceanographic sciences; oceanographic resources--ships, instrumentation, and manpower and training; and the National budget for oceanography in detail.

Progress in Oceanography, vol. 1, edited by Mary Sears, 391 pp., illus., printed, 1963, \$15. Pergamon Press, 122 E. 57th St., New York 22, N. Y. Includes 5 papers: "Geological investigation of near-shore sand-transport," by E. Seibold; "Electrification of the atmosphere," by D. C. Blanchard; "Suspended organic matter in sea water," by T. R. Parsons; "The salinity problem," by R. A. Cox; and "Gulf stream '60," by F. C. Fuglister.

Recent Oceanographic Expeditions, USSR, OTS 64-21588, 59 pp., illus., printed, February 18, 1964, \$1.50. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.)

#### Role of Marine Fungi in the Biochemistry of the Oceans.

II--Effect of Glucose, Inorganic Nitrogen, and Tris (Hydroxymethyl) Aminomethane on Growth and pH Changes in Synthetic Media, by Peter L. Sgueros and Jacqueline Simms, Contribution No. 491, 14 pp., illus., printed, (Reprinted from *Mycologia*, vol. LV, no. 6, November-December 1963, pp. 728-741.) Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### PERU:

"Contribucion al Conocimiento de la Zona de Littorina en la Costa Peruana" (Contribution to the Knowledge of the Shallow-Water Zone of the Peruvian Coast), by M. Vegas V., article, *Anales Cientificos*, vol. 1, no. 2, July-August-September 1963, pp. 174-193, illus., printed in Spanish with English summary, single copy \$2. Universidad Agraria, Departamento de Publicaciones, Apartado 456, Lima, Peru.

#### PHYSIOLOGY:

Investigation into the Mode of Action of the Lateral Line System of Fish, by E. E. Sucklin and J. A. Sucklin, OTS 64-1T018, 11 pp., processed, January 8, 1964, \$1.00. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Studies in Gas Metabolism of Cold-Blooded Animals and Migrations and Radioactivity of Certain Marine Animals, USSR, OTS 64-21592, 56 pp., illus., printed, February 18, 1964, \$1.50. (Translated from the Russian, *Zoologicheskii Zhurnal*, November 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

#### PLANKTON:

Feeding of Zooplankton, with Special Reference to Some Experiments with SAGITTA, by M. R. Reeve, Contribution No. 510, 4 pp., printed, (Reprinted from *Nature*, vol. 201, no. 4915, January 11, 1964, pp. 217-213.) Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### PRESERVATIVES:

"Effect of Preservatives on Ripening and Keeping Qualities", by L. S. Levieva and S. I. Ivanova, article, *Chemical Abstracts*, vol. 59, July 22, 1963, 2097g, printed, American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### PROCESSING:

"Recent Advances in Fish Processing Technology", by R. Spencer and R. B. Hughes, article, *Food Manufac-*

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ture, vol. 38, August 1963, pp. 407-412, printed, Leonard Hill, Ltd., Stratford House, 9 Eden Street, London NW1, England.

#### RADIATION:

"Schistosomiasis: Age of Snails and Susceptibility to X-irradiation," by Alina Perlowagora Szumlewicz, article, *Science*, vol. 144, no. 3616, April 17, 1964, pp. 302-303, printed, single copy 35 cents, American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### RESEARCH VESSEL:

A Report on the Conversion of U.S. Army T-Boat 427 to an Oceanographic Research Vessel, by James Gibbons, OTS 63-10043, 25 pp., processed, November 1963, \$2.60, Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### ROUGH FISH:

Experimental Crappie Removal; Final Report, by James P. Carter, 18 pp., printed, 1963, Division of Fisheries, Department of Fish and Wildlife Resources, New State Office Bldg., Frankfort, Ky.

#### SALMON:

Atlantic Salmon Journal, no. 1, March 1964, 39 pp., illus., printed, Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Contains, among others, articles on: "Salmon Spawning Channel," by J. J. Quigley; "The Atlantic Salmon Commercial Fishery," and "Moving Forward in Salmon Conservation," by H. J. Robichaud.

Cyclic Dominance in Adams River Sockeye Salmon, by F. J. Ward and P. A. Larkin, Progress Report No. 11, 120 pp., illus., processed, 1964, International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada.

"Scientists Probe Celebrated Salmon Enigma," article, *Trade News*, vol. 16, no. 9, March 1964, pp. 3-4, illus., processed, Information and Consumer Service, Department of Fisheries, Ottawa. Both Canadian and United States fisheries scientists are interested in finding out why all five species of Pacific salmon spawn only once and die shortly afterwards; while Atlantic salmon frequently survive, return to salt-water, and come back again to fresh-water spawning grounds. Halifax, Nova Scotia researchers are trying to provide an answer.

Survey of Chinook Salmon Spawning Grounds in the Upper Salmon River Drainage, 1962, by Ted Bjornn, Don Corley, and Jerry Mallet, 41 pp., illus., printed, 1963, Fisheries Division, Idaho Fish and Game Commission, 518 Front St., Boise, Idaho.

"Trolling for Pacific Salmon," article, *Trade News*, vol. 16, no. 9, March 1964, pp. 7-9, illus., processed, Information and Consumer Service, Department of Fisheries, Ottawa, Canada. A pictorial story of the British Columbia salmon industry.

#### SHARKS:

Sharks of the Family Lamnidae, by G. Brooke Farquhar, Translation No. 157, 16 pp., printed, April 1963, 30 cents, U.S. Naval Oceanographic Office, Washington, D. C. 20390.

#### SHRIMP:

"Los Camarones Comerciales de la Familia Penaeidae de la Costa Atlantica de America del Sur: Clave para el Reconocimiento de las Especies y Datos Bioecologicos" (The Commercial Shrimp of the Family Penaeidae of the Atlantic Coast of South America: Key to the Recognition of the Species and Bioecological Data), by Enrique E. Boschi, article, *Boletin del Instituto de Biologia Marina*, no. 3, February 1963, pp. 1-39, illus., printed in Spanish, Instituto de Biologia Marina, Universidades Nacionales de Buenos Aires, La Plata y del Sur, Mar del Plata, Argentina.

"Greatest Shrimping Grounds in Western Hemisphere," article, *The Fish Boat*, vol. 9, no. 3, March 1964, pp. 69-139, illus., printed, single copy 50 cents, H. L. Peace Publications, 624 Gravier St., New Orleans 12, La. A group of articles devoted to the new shrimping grounds off northern South America--Barbados, Paramaribo, St. Laurent, Cayenne, and Georgetown. Includes individual articles on: "U.S. 'Know-How' is Building Greatest Shrimp Fishery in the Western Hemisphere--75,000 Square Miles;" "Deep-Water Harbor, Modern Facilities Aid Newest Bid for Shrimp Business;" "Top Builder: Mr. Standardized Fleet;" and "British Guiana: Marketing 'Know-How,' Standardization Are Major Keys to Continuing Growth." Also presents articles about: "Dutch Guiana: Pioneer in New Fisheries Has Outstanding Plant and Facilities;" "Surinam and French Guiana Plants Boast Modern Freezing Equipment;" "French Guiana: New Plants and Fleets Being Readied in Expansion Program; Henderson Goes from Tangled Jungle to Elaborate Plant in Single Year;" "Will Fisheries Provide the Basis for Economic Revolution to the South?" by David B. Lord; "Trawlers with Many Novel Features Joins French Guiana Shrimp Fleet;" and others.

"Management of Marine Resources: Hydrography," by T. B. Ford, article, *Louisiana Conservationist*, vol. 16, nos. 5 and 6, May-June 1964, pp. 20-22, illus., printed, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. With an understanding of various water conditions in the coastal areas, Louisiana researchers expect to be able to predict in advance production trends for the shrimp industry, determine causes of erratic changes in populations, and develop sound management practices for the commercially important shrimp species.

"Succulent Shrimp," by George Allen, article, *Alabama Conservation*, vol. XXXIV, no. 1, December 1963-January 1964, pp. 17-19, illus., printed, Alabama Department of Conservation, 64 N. Union St., Montgomery 4, Ala.

#### SMALL BUSINESS MANAGEMENT:

Accounting and Financial Data for Small Retailers, by Homer A. Brown and Alva A. Cummings, Management Research Summary, 2 pp., processed, 1964, Small Business Administration, Washington, D. C. 20416. An accounting system for small retailers should provide, among other things, a means of: recording all transactions of the business; safeguarding the business from errors and fraud; and controlling operations. Good accounting records are the basis for many analyses that can be helpful in interpreting the results of past operations and in planning for the

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future. The value of the analyses, however, depends on proper application of their results.

**Export Marketing for Smaller Firms**, 101 pp., processed, May 1963, 50 cents. Small Business Administration, Washington, D.C. 20416. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) With the owner or manager of a small firm lies the ultimate responsibility for the decision to commit his firm's resources toward the search for profits in foreign markets. The successful exploitation of overseas opportunities requires good business planning and judgment coupled with accurate and up-to-date facts about the overseas environment. This report covers these topics: "Measuring Your Export Potential;" "Selection of an Attractive Market for Detailed Analysis;" "Detailed Evaluation of Markets and Requirements for Successful Exporting;" and "Channels of Distribution."

**Financial Facts which Lenders Require**, by Selwin E. Price, Management Aids for Small Manufacturers 164, 4 pp., processed, May 1964. Small Business Administration, Washington, D.C. 20416. This leaflet discusses the various kinds of financial facts which lenders require of prospective borrowers when considering a loan. The lending officer bases his judgment upon: (1) The type and nature of business collateral such as accounts receivable and inventory; (2) the company's audited financial statements; (3) the company's sales and cash projections; and (4) the company's operating and financial ratios. He also needs additional information so he can keep abreast of the company's progress during the life of the loan.

**Financing Problems of Small Manufacturers**, by Seymour Friedland, William A. Dymaza, and Thomas Moranian, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D.C. 20416. A summary of a report on financing problems of small producers. Findings of the report identify the basic problem of small-business financing as low net worth resulting from low profitability. The report suggests that more of the resources available for helping small business be applied to this problem. Areas recommended for consideration include counseling of small-business managers, redesigning of some control techniques for small-scale operations, and a mutual fund to facilitate stock financing by small firms.

**Keeping Machines and Operators Productive**, by Howard Pyle, Management Aid for Small Manufacturers 162, 4 pp., processed, April 1964. Small Business Administration, Washington, D.C. 20416. Plant safety pointers for owner-operators are offered in this leaflet. Points out that false attitudes of supervisors and employers can hamper the owner-manager's accident prevention efforts. Describes the kinds of moving parts of machinery which should be guarded and suggests kinds of guards that can be used to prevent injuries. Sources of help which the owner-manager may find useful in setting up a machine guarding program are also listed.

#### SMOKING:

"Pretreatment for Smoking Oily Fish," by Minoru Fujii and others, article, *Chemical Abstracts*, vol. 58, May 27, 1963, 11899b, printed, American

Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### SPAIN:

"Asturias y el Mar en la Estadística de 1963" (Asturias and the Sea in the 1963 Statistics), by Daniel Arbesu, article, *Puntal*, vol. XI, no. 119, February 1964, pp. 23-24, printed in Spanish. *Puntal*, Apartado de Correos 316, Alicante, Spain.

"Espana, Primer Pais Pesquero de Europa" (Spain, First Fishery Country of Europe), by Fandino, article, *Puntal*, vol. XI, no. 119, February 1964, pp. 2-3, illus., printed in Spanish. *Puntal*, Apartado de Correos 316, Alicante, Spain.

"La Industria Espanola de Conservas de Pescado" (The Spanish Fish Canning Industry), by Antonio Alfageme del Busto, article, *Informacion Conservera*, vol. XI, no. 111-112, March-April 1964, pp. 67-70, printed in Spanish, single copy 60 Ptas. (US\$1). *Informacion Conservera*, Colon, 62, Valencia, Spain.

#### SPINY LOBSTER:

"Spiny Lobster Industry in Southern Africa (An Economic Survey)," by D. J. Soares-Rebello, article, *South African Journal of Science*, vol. 60, no. 3, March 1964, pp. 81-87, printed, single copy 50 cents (about 70 U.S. cents). The South African Association for the Advancement of Science, P.O. Box 6894, Johannesburg, South Africa Republic. Detailed information is given on the thriving spiny lobster industry of the Republic of South Africa and of the mandated territory of South-West Africa. Spiny lobster fishing, production, exports, consumption, canning and processing, regulation, conservation measures, and economic significance in both those countries are discussed at length.

#### STANDARDS:

**Standards and Requirements for Fish Handling, Processing, Distribution, and Quality**, by D. D. Tapiador and J. E. Carroz, Fisheries Report No. 9, 255 pp., processed, 1963. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. The 11th FAO Conference endorsed under the regular program of the Fish Processing Section, Technology Branch, the preparation of a document on laws and regulations concerning fish handling, processing, distribution, and quality control. In addition, it is the aim of FAO, in launching the Freedom from Hunger Campaign, to encourage increased fish production; promote its greater availability; and widen distribution by building up trade in fishery products and ensuring improvements in their quality. This report is essentially a study and digest of governmental codes, laws, and regulations.

#### ST. PIERRE AND MIQUELON:

"St. Pierre et Miquelon Peut Produire du Poisson Surgelé au Prix Internationale" (St. Pierre and Miquelon are Able to Produce Frozen Fish at the International Price), by H. Clarieaux, article, *France Pêche*, no. 81, February 1964, pp. 19, 21-22, illus., printed in French. *France Pêche*, Boite Postale 179, Lorient, France.

#### TRAWLERS:

"Some Fundamentals for the Calculation of the Motion of a Trawler with Trawl Gear," by H. Stengel,



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article, *Fischereiforschung*, vol. 5, no. 3, 1962, pp. 10-14, printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, E. Germany.

#### TUNA:

"La Determinazione dell'Istamina nei Tonni del Golfo di Guinea" (The Determination of the Histamine in the Tuna of the Gulf of Guinea), by H. Plagnol and J. F. Aldrin, article, *Industria Conserve*, vol. XXXVIII, no. 4, October-December 1963, pp. 321-327, illus., printed in Italian, single copy L. 1,500 (about US\$2.40). *Industria Conserve*, Viale Tanara 33, Parma, Italy.

#### TURKEY:

*Balik ve Balıkcılık* (Fish and Fishery), vol. XII, no. 3, March 1964, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G.M., Balıkcılık Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Sponge. (Part II);" "The Postmortem Changes in Turkish Sea-Water Fishes (Part I);" and "Importance of Fisheries Production in the Food Economy of the World."

*Balik ve Balıkcılık* (Fish and Fishery), vol. XII, no. 4, April 1964, 33 pp., illus., printed in Turkish with English table of contents and abstracts. Et ve Balik Kurumu G.M., Balıkcılık Mudurlugu, Besiktas, Istanbul, Turkey. Includes articles on: "The Sponge. (Part III);" "Fish Pump;" "Basic Researches on the Development of Fishes in Turkish Fresh Waters, Lakes, and Dams. Part III;" "Used Materials in Netting and New Products;" "Israel's Sea Fisheries;" and "The New Activities of Processing for the Aim of More Stability and Situation of High Fish Meal Production in the World."

#### U.S.S.R.:

*Rybnoe Khoziaistvo*, vol. 40, no. 3, March 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U.S. cents). *Rybnoe Khoziaistvo*, B-140, V. Krasnodel'skaia 17, Moscow, U.S.S.R. Includes, among others, article on: "The Abundance of Herring in the Caspian Sea," by N. I. Kozhin; "Optimal Dosage and Rational Use of Sperm during Insemination of Salmon Eggs," by V. Z. Trusov and L. M. Pashkin; "Arsenic as an Indicator of Sanitary and Hydrobiological Conditions of Reservoirs in the Ukrainian Steppe," by C. P. Fedii; "Improvement Made on the Production and Transport Refrigerator Kaliningrad," by A. G. Ionov; "Production of Processed Herring on the Floating Base Iokhannes Vares," by L. G. Visk; "Vibration Conveyers and the Transportation of Fish," by L. M. Stolin and A. Z. Umantsev; "Mechanization of the Moving Cages in Smoking Houses," by G. E. Akhalkov and E. A. Shmul'an; "New Types of Canned Fish Products: Fish and Vegetables Canned with Georgian-Type Sauces," by L. E. Tsuladze; "The Determination of the Level of Mechanization of the Basic Production in Fishery Plants," by I. Mogilevskii and M. Shuva-lova; and "The Profile of a Mechanical Engineer Specialized in the Fishing Industry," by Iu. B. Iudovich.

--Milan A. Kravjanja

illus., printed, February 19, 1964, 50 cents. (Translated from the Russian, Pravda, January 25, 1964.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20235.

"Sovjetske Fiske i Stark Utveckling; Systematisk Forskning Visar Vagen" (Strong Development; Systematic Fisheries; Systematic Research Finds its Way), article, *Svenska Vastkust Fiskaren*, vol. 34, no. 5, March 1964, pp. 96-97, illus., printed in Swedish. Svenska Vastkustfiskarnas, Ekonomiskottet Postbox 1014, Goteborg 4, Sweden.

The following processed reports are for sale by the Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230, at 50 cents a copy.

Age of the Ob Whitefish (COREGONUS MUKSUN) and Some Problems in Theory. by V. V. Barsukov, OTS 63-11110, 7 pp., 1963. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 39, no. 10, 1960, pp. 1525-1530.)

Feeding and Food Relationships of Predatory Fishes in the Northern Part of the Rybinsk Reservoir. by E. S. Zadul'skaya, OTS 63-11127, 57 pp., 1963. (Translated from the Russian, *Trudy Darvinskogo Gosudarstvennogo Zapovednika*, no. 6, 1960, pp. 345-405.)

Effect of Temperature on the Embryonic Development of the Pike, the Blue Bream (ABRAMIS BALLERUS L.) and the White Bream (BLICCA BJOERKNA L.). by V. M. Volodin, OTS 63-11124, 7 pp., illus., 1963. (Translated from the Russian, *Trudy Instituta Biologii Vodokhranilishch*, vol. 3, no. 6, 1960, pp. 231-237.)

Sanitation Bacteriological Control Analyses in the Fish Preserving Industry. by Yu. A. Ravich-Scherbo, OTS 63-11119, 4 pp., 1963. (Translated from the Russian, *Voprosy Pitaniya (Morskva)*, vol. 19, no. 5, 1960, pp. 79-82.)

Symposium on Problems Related to the Population Dynamics of Commercial Animals. by G. B. Nikol'skii, OTS 63-11117, 4 pp., 1963. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 36, no. 11, 1960, pp. 1747-1750.)

#### VIRGINIA:

64th and 65th Annual Reports of the Commission of Fisheries of Virginia (for the Fiscal Years Ending June 30, 1962 and June 30, 1963), 32 pp., illus., printed. Commission of Fisheries, Newport News, Va. Discusses enforcement and personnel, work of the engineering Department, Potomac River activities, fishery statistical collection, and oyster research. Also covers accomplishments by the commission in conservation and rehabilitation, pollution control, fishery legislation, and other areas. Statistical tables present data showing receipts from the fish and oyster industry, by districts; recorded oyster planting grounds; and other related information.

#### VITAMIN A:

"Vitamin A Enriched Fish Sausage. I--A Determination of Vitamin A Enrichment in Fish Sausage, and Loss of Vitamin A during Manufacturing and Storage," by Masao Hasegawa and Tomiyo Nishimura, article,

Sakhalin Fishermen Initiate Socialist Competition to Increase Fish Catches, USSR, OTS 64-21597, 6 pp.,

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Chemical Abstracts, vol. 58, May 27, 1963, 1189d, printed, American Chemical Society, 1155 16th St., NW., Washington 6, D. C.

#### WHALING:

International Whaling Statistics, no. LII, 48 pp., printed, 1964, Det Norske Hvalrads Statistiske Publikasjon, Oslo, Norway. Results of the whaling operations in the Antarctic during the season 1962/63. Includes statistical tables on whaling operations of Japan, the Netherlands, Norway, United Kingdom, and the U.S.S.R.; average size of whales caught; and number of whales caught, by species, sex, and size. Also includes data on average production of oil per blue-whale unit.

"Whale Marking Cruises in New Zealand Waters Made between August and December 1963," by D. E. Gas-kin, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 2, February 1964, pp. 29-41, illus., printed, Hvalfangerforeningen, Sandefjord, Norway.

Whaling: Amendments to the Schedule to the International Whaling Convention Signed at Washington on December 2, 1946 (Adopted at the Fifteenth Meeting of the International Whaling Commission, London, July 5, 1963), Treaties and Other International Acts Series 5472, 3 pp., printed, 1964, 5 cents. Department of State, Washington D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### CORRECTION

In the February 1964 issue, page 99, article, "A Study of Redfish, *Sciaenops ocellata* (Linnaeus) and Black Drum, *Pogonias cromis* (Linnaeus)," the address of the publisher of the Publications of the Institute of Marine Science, was given in error. The correct address is Institute of Marine Science, University of Texas, Port Aransas, Texas.



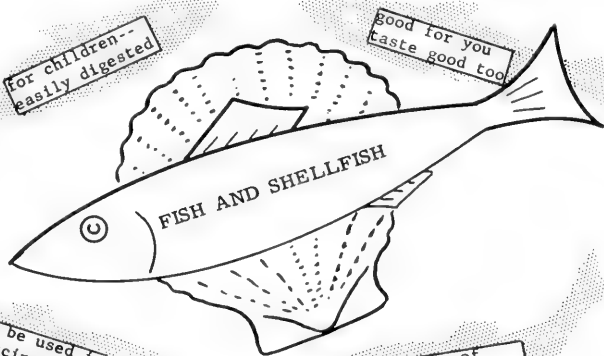
#### FISHERIES IMPORTANT TO UNITED STATES

The fisheries of America have played a unique part in this country's economy since its founding. John Cabot, returning to England in 1498 from North America, stated that "the sea there is swarming with fish which can be taken not only with the net, but in baskets let down with a stone." Historians record that the founders of the Plymouth Colony came to America to serve God and to catch fish.

The colorful New Bedford and Nantucket whaling fleets ranging the oceans of the world in the 19th century were a large factor in forming the bonds which eventually joined Hawaii to the United States. The great salmon fisheries have been a principal support of Alaska through the years and have been a greater source of wealth than all the gold produced there since the Alaska gold rushes began. During World War II, the spectacular tuna clipper fleet furnished the ships and the men which maintained contact with our beleaguered troops during their initial days of perilously slight foothold on the Solomon Islands, and these same fishing boats helped supply small island garrisons throughout the vast reaches of the Pacific during the entire war. U. S. trawlers and purse seiners also went to war as minesweepers and patrol vessels.

--Excerpt from Trident--A Long Range Report of the Bureau of Commercial Fisheries, Circular 149.

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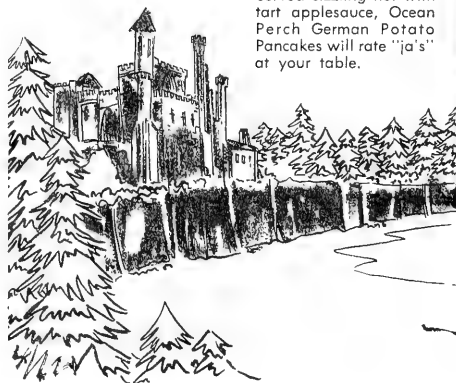
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inspection U.S. Department  
of the Interior

## OCEAN PERCH GERMAN POTATO PANCAKES

- |  |                                   |
|--|-----------------------------------|
| 1 pound ocean perch fillets or other fish fillets, fresh or frozen | 2 teaspoons salt                  |
| 3 eggs, beaten   | Dash nutmeg                       |
| 2 tablespoons flour  | Dash pepper                       |
| 2 tablespoons grated onion   | 2 cups finely grated raw potatoes |
| 1 tablespoon chopped parsley                                       | Applesauce                        |

Thaw frozen fillets. Skin fillets and chop finely. Combine all ingredients except Applesauce; mix thoroughly. Drop  $\frac{1}{2}$  cup fish mixture onto a hot, well-greased griddle or frying pan. Flatten slightly with a spatula. Fry until brown on one side; turn carefully and brown the other side. Cooking time approximately 6 to 8 minutes. Drain on absorbent paper. Keep warm. Serve with Applesauce. Serves 6.

In this recipe home economists from the Bureau of Commercial Fisheries have given chafing-dish elegance with iron-skillet economy. Tastefully supplemented with aromatic nutmeg and lively parsley, meaty fillets from the cold North Atlantic provide a wealth of energy-giving protein. Served sizzling hot with tart applesauce, Ocean Perch German Potato Pancakes will rate "ja's" at your table.



--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas."  
Issued by the National Marketing Services Office,  
U. S. Bureau of Commercial Fisheries, Chicago, Ill. 60607.



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#### IMPORTANT NOTICE

Due to an unexpected mix-up in the mailing of the June 1964 issue of the magazine, there are probably a number of subscribers who did not receive that issue. If you are one of those who did not receive that issue, write us for a copy.

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# COMMERCIAL FISHERIES REVIEW



VOL. 26, NO. 8

AUGUST 1964

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
*Fish and Wildlife Service*  
*Bureau of Commercial Fisheries*  
*Washington, D.C.*







# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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# COMMERCIAL FISHERIES REVIEW

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## THE GUINEAN TRAWLING SURVEY

By Frank Williams\*

### INTRODUCTION

The original investigation for the exploration of the Gulf of Guinea (Guinean Year) as conceived by the Commission for Technical Co-operation in Africa (CCTA) in 1960 included:

1. an oceanographic program (for measurement of physico-chemical conditions, movements of water masses, productivity, etc.);
2. a trawling survey on the continental shelf;
3. an exploratory fishing survey for sardines (Clupeidae); and
4. an exploratory fishing survey for tunas and tuna-like fishes (Scombridae).

As is now generally known, the oceanographic investigation expanded into a study of the waters of the whole of the tropical Atlantic Ocean--the International Co-operative Investigations of the Tropical Atlantic (ICITA). Those investigations have been coordinated by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, and the three phases of the survey (EQUALANTI, II, and III) have now been completed. The exploratory fishing survey for sardines has so far been restricted to a small project started in Ghana by the Fisheries Biology Branch of FAO. However, it is hoped that a large-scale international survey of the sardine stocks will be initiated in the not-too-distant future. The exploratory tuna fishing survey, being conducted by the Bureau of Commercial Fisheries of the U. S. Department of the Interior, commenced in 1963 and will continue through 1965.

Of the original Guinean Year there remained to be carried out under the aegis of CCTA only the trawling survey which was renamed the Guinean Trawling Survey (GTS). The principal sponsor is the U. S. Agency for International Development (US/AID) with further direct financing from the United Kingdom Department of Technical Co-operation (UK/DTC).

### PURPOSE

The purpose of the survey is to investigate the demersal fish potential of the West African continental shelf in relation to the environmental conditions.

### AIMS

Within the area of operations the aims of the survey are:

1. To assess the qualitative and quantitative composition of the exploitable fish stocks.
2. To assess and ascertain the size composition of those species of fish of paramount commercial importance.
3. To compare productivity in different fishing areas.

\*Director, Guinean Trawling Survey (Campagne de Chalutage dans le Golfe de Guinée), c/o CCTA, P.M.B. 2359, Lagos, Nigeria.

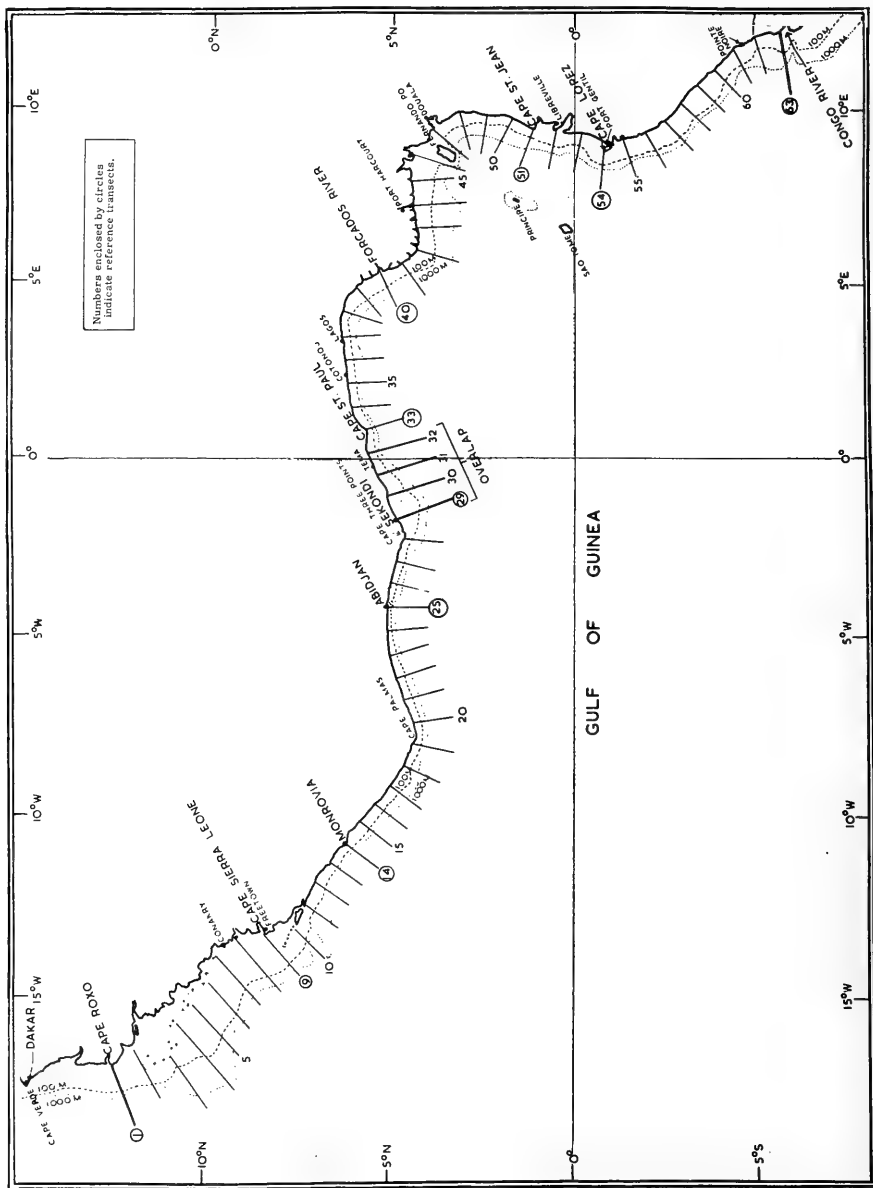


Fig. 1 - The area of operations for the survey extended from Cape Roxo to the mouth of the Congo River. Fishing take places at each of 63 transects spaced 40 miles apart at right angles to the coast.

4. To relate 1, 2, and 3 to the hydrographic climate.
5. To locate areas which seem to be most favorable for commercial trawling in relation to depth, nature of ground, and availability of exploitable fish stocks.
6. To provide reference and study collections of fish of the area for those countries, organizations, institutes, and individuals desirous of receiving them.

#### AREA OF OPERATIONS

The area of operations extended from Cape Roxo (lat.  $12^{\circ}30'$  N.) to the mouth of the Congo River (lat.  $6^{\circ}$  S.), a distance of nearly 2,700 nautical miles (see fig. 1).

#### TIMETABLE

Preparatory Phase . . . . .	September 1, 1962, to September 1, 1963.
Operational Phase . . . . .	September 2, 1963, to June 15, 1964.
Report Phase . . . . .	June 16, 1964, to August 31, 1965.

#### OPERATIONAL PHASES:

GUINEAN I . . . . .	September 2, 1963, to December 20, 1963.
GUINEAN II . . . . .	February 15, 1964, to June 15, 1964.

The timing of the survey was planned to coincide as closely as possible with the hydrographic seasons in the area. In the transition zones Cape Roxo to Conakry and Cape Lopez to the Congo River, there are two distinct seasons with a considerable temperature variation. The timing of the survey was such that trawling in those areas was carried out in the last 4-6 weeks of GUINEAN I and GUINEAN II and thus the two seasons were covered effectively. In the Equatorial Zone, Conakry to Cape Lopez, the hydrographic variations are not so great, except in the area of upwelling centered off the Ghana coast during July to September. Part of the period of upwelling was covered during the opening months of GUINEAN I, while normal conditions prevailed during GUINEAN II.

#### VESSELS

Two French trawlers were chartered for 13 months--June 15, 1963, to July 15, 1964, from Monsieur R. Sanquer of La Rochelle, France. The vessels--Thierry (fig. 2) of 230 tons and La Rafale of 200 tons--were 35 m. (114 ft.) overall, with a beam of 7 m. (23 ft.) and a draft of 4.5 m. (14 ft.). Powered by 600-hp. main engines, the trawlers are fitted with hydraulic trawl winches carrying 1,800 m. (5,880 ft.) of 21 mm.  $\frac{1}{4}$ -inch cable. The vessels were converted for scientific use and operations in tropical waters prior to leaving France for West Africa. The conversion included provision of a small laboratory, extra accommodations, mess, cold-rooms ( $-20^{\circ}$  C. or  $-4^{\circ}$  F. and  $0^{\circ}$  C. or  $32^{\circ}$  F.), electronic log, additional echo-sounder, additional auxiliary engine, alternators for



Fig. 2 - Trawler Thierry seen from the bridge of La Rafale.

a.c. current, air conditioning units, etc., and installation of a hydrographic winch on each vessel.

### OPERATIONAL PLANS

Fishing took place at each of 63 transects spaced 40 miles apart at right angles to the coast from Cape Roxo to the Congo River (fig. 1). Eight stations were fished on each transect at the following depths: 15-20 m., 30 m., 40 m., 50 m., 70-75 m., 100 m., 200 m., 400-600 m. (8-10, 15, 20, 25, 35-38, 50, 100, 200-300 fathoms). To be able to estimate the difference in the fishing power of the vessels, during the first month of each operational phase 4 transects off the coast of Ghana were fished simultaneously twice by the two vessels. All routine trawling was carried out during daylight, but some night trawling was undertaken at selected stations. The fishing gear for the survey was standardized aboard the two vessels; the headrope size was 25 m. (80 ft.) and that of the cod-end mesh 40 mm. stretched ( $1\frac{3}{8}$  inch). The cod-ends were made of nylon, the rest of the net of manila. Mesh measurements were made on cod-ends at set intervals using the I.C.E.S. mesh gauge.

### SCHEDULE OF OBSERVATIONS

A continuous record of sea surface temperatures was made throughout the survey and notes were made on sightings of schools of fish, sea birds, drifting organisms, etc.

Before trawling began at each station, the following observations were made: bottom sampling; bathythermograph cast; reversing bottles for water samples for temperature; salinity, and oxygen at surface and bottom; meteorological and sea surface observations (ICITA style); Secchi disc; microbiomass; etc. The oxygen analyses were carried out on board the trawlers, while salinity samples were processed ashore at the Federal Fisheries Service, Lagos (Nigeria) and the Oceanographic Centre, Abidjan (Ivory Coast). The trawl hauls at all stations were each of one hour's duration, and all trawling was normally made with the current, following closely the requisite

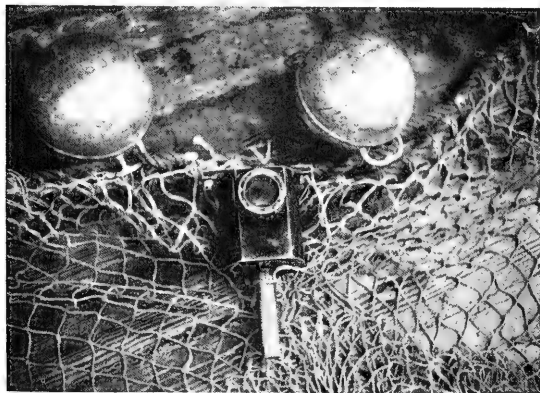


Fig. 3 - The independent trawl thermograph: (a) left--mounted on the headrope of the trawl; (b) right--with the pressure casing removed to show the recording drum.

depth contour. The water temperature at the mouth of the trawl net was recorded by an independent thermograph mounted on the headrope (figs. 3a and b).



The catches made by the trawl (figs. 4a and b, and 5) were sorted into the various constituent species, and the number and weight of each recorded. With large catches, random subsamples of the total catch were used for this purpose. For 12 commercially important

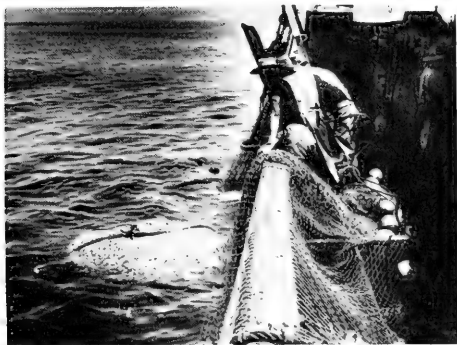


Fig. 4 - An exceptionally large catch made by the *La Rafale*, off the Ivory Coast (about 4 metric tons): (a) left--cod-end at the side of the vessel; (b) right--because of the weight of the catch, the cod-end was split and lifted in two sections. The small grunter (*Brachydeuterus auritus*) seen here formed about 90 percent of the catch.

species of fish, length-frequency measurements were made on random samples of 250 fish. Measurement of the various species of shrimp was based on the number of individuals per kilogram.

Comprehensive collections of fish and invertebrates of the West African continental shelf were made during the survey.

#### EQUIPMENT

Equipment for oceanography and fisheries to cover the agreed program as well as the more general items required by any scientific survey was provided. Three types of logbooks (hydrographic; general for trawl stations; fish-length frequencies) were designed and used by the survey.

Additional scientific equipment was provided by FAO, UNESCO, and the German Federal Republic.

#### SCIENTIFIC PERSONNEL

The scientific personnel on each vessel consisted of three biologists (one was cruise leader) and one hydrographer/biologist. The personnel were assigned to the survey by European countries and the United States under technical assistance agreements, West African fisheries research or oceanographic organizations, and international organizations. The countries and organizations represented included Belgium, France, German Federal Republic, Ghana, Ivory Coast, the Netherlands, the United States, and FAO. A total of 64 man-months of service was provided by those scientists.

#### FACILITIES IN WEST AFRICA

Facilities (e.g. housing, office, base port facilities, etc.) were granted by West African governments and CCTA.



Fig. 5 - A sting ray (*Dasyatis* sp.) taken by *La Rafale* off the Ghana coast. Length of body 6 ft., length of tail  $7\frac{1}{2}$  ft., width across wings  $7\frac{1}{2}$  ft., weight about 700 lbs. Sting rays up to 500 lbs. are not uncommon in West African trawl catches.

## SCIENTIFIC COMMITTEE

The Director of the Guinean Trawling Survey is advised by a scientific committee composed of fisheries scientists from France, Ivory Coast, Nigeria, the United States, and CCTA. In addition, FAO, UNESCO, and other interested organizations are represented by observers. The committee meets annually under the Chairmanship of Professor Th. Monod, President of the Scientific Council for Africa (CSA).

## REGIONAL AND INTERNATIONAL LIAISON

Close contact has been maintained between the survey and the fisheries and oceanographic laboratories in the West African area, in relation to local research and other programs being carried out by those organizations during the lifetime of the trawling survey.

In the international sphere, close liaison has also been maintained with the Fisheries Biology Branch of FAO and the Bureau of Oceanography and the IOC of UNESCO.

The National Oceanographic Data Center (NODC), Washington, D.C., has agreed to process the survey's hydrographic data for the West African continental shelf and publish them as ICITA supplementary data reports (GUINEAN I; EQUALANT II, and GUINEAN II; EQUALANT III). The Smithsonian Oceanographic Sorting Center (SOSC) Washington, D. C., has agreed to sort benthic samples collected by the survey. UNESCO, under a training scheme, is to provide a fish taxonomist at Abidjan to set up a temporary fish sorting center to (1) effect a basic breakdown of the survey's fish collections, and (2) train local West African staff in that task and also in the curating of collections.

## PROGRESS TO DATE

During the whole period of GUINEAN I and II, fishing proceeded satisfactorily and all scheduled biological and hydrographic observations were made.

Two aspects of the results have been investigated so far:

1. Analysis has commenced of the results of the overlap transects for GUINEAN I and II (when the two vessels fished together for one month) to determine the degree of variation between the catch rates of the two vessels.
2. For GUINEAN I and II the catches of pelagic fishes caught in the trawls have been analyzed. Preliminary results show that considerable catches of sardine (*Sardinella*), mackerel (*Scomber*), scad (*Trachurus*), and mackerel scad (*Decapturnus*) were made in many areas at depths of 30-100 m. (15-50 fathoms). Those findings are of great interest, especially in the view of the existing seasonal fisheries at the surface and the possible projected resources survey for those species in the West African area.

## FUTURE

The methods for the Stage I analysis of the results (which mainly concerns data extraction from survey records) have been planned and three types of data forms printed. Stage II of the analysis and the publication of the final reports have also been considered, but those all depend to a certain extent on the results of Stage I.

The operational phases of the survey ceased in mid-June 1964. About the end of October 1964, it is hoped that the Director of the trawling survey will transfer his offices to the Biological Laboratory, U. S. Bureau of Commercial Fisheries, Washington, D.C., for the report and analysis period. It is expected that the survey report will be completed and sent to the printers towards the end of 1965. Progress reports will be issued at intervals during that period so that governments and the fishing industry in West Africa may be able to use information for future planning as rapidly as possible.

## CHANCES IN ABUNDANCE OF THE MARINE WORM, GLYCERA DIBRANCHIATA, ASSOCIATED WITH SEAWATER TEMPERATURE FLUCTUATIONS

By Robert L. Dow\*

Two species of marine annelids (worms) used as bait for salt-water sport fishing support the fourth most valuable fishery in Maine with a 1963 landed value of \$1.2 million.

The bloodworm, *Glycera dibranchiata*, has the highest landed unit value of any Maine marine resource. To the more than 900 licensees in 1963, bloodworms had a value of \$2.40 a pound. The sandworm, *Neanthes virens*, also hand-dug from intertidal growing areas during low tide, with a landed value of about \$1.10 a pound, has the second highest unit value.

Table 1 - Maine Production of Bloodworms, 1946-1963

Year	Number of Worms
	In Millions
1963 . . . . .	32.2
1962 . . . . .	25.7
1961 . . . . .	26.1
1960 . . . . .	24.2
1959 . . . . .	18.8
1958 . . . . .	13.6
1957 . . . . .	10.5
1956 . . . . .	7.5
1955 . . . . .	8.9
1954 . . . . .	10.6
1953 . . . . .	11.2
1952 . . . . .	9.2
1951 . . . . .	9.5
1950 . . . . .	13.7
1949 . . . . .	17.7
1948 . . . . .	25.0
1947 . . . . .	7.2
1946 . . . . .	2.6

Although worms are bought by dealers by the hundred, for statistical purposes such purchases are converted to pounds using a factor of 44 for bloodworms and 40 for sandworms.

Recent sampling has indicated that the average pound contains more than 50 sandworms or more than 100 bloodworms. Market acceptance of smaller sizes accounts for the increase in value per pound.

By reason of negligible winter markets and frozen or ice-covered intertidal areas, the fishery is limited to the March-November period. During the harvesting season, high demand encourages an intensive fishery; in the case of bloodworms, probably the most intensive fishery in Maine. Only since 1946 have landings of the two species been separated. Production of the bloodworm fishery by calendar years is listed in table 1.

Reasons for fluctuations in production suggested by the industry as well as by scientific investigators have ranged nearly as widely as landings themselves.

\*Research Director, Maine Department of Sea and Shore Fisheries, State House, Augusta, Maine.



Fig. 1 - Digging bloodworms in intertidal area, Cod Cove, Wiscasset, Maine.

Restrictive legislation had rapidly increased from 1937 with the early beginnings of the fishery, only to culminate in complete repeal of all regulations by 1955. Regulations had curtailed the free-roving activities of commercial diggers, but it was three years after the effective date of repeal before there was any appreciable increase in landings.



Fig. 2 - Close-up of fisherman digging bloodworms.

Cyclic changes in the environment (Dow 1951, Dow and Wallace 1955), gradual changes in soil composition (Klawe and Dickie 1957), expansion of area fished (Dow and Wallace 1955), and changes in tidal exposure because of bridge and highway construction (Ganaros 1951) are other factors which have exercised relatively minor or local influence.

Dow and Wallace (1955) concluded that year-to-year fluctuations in production were indicative of short-term natural fluctuations in abundance. Klawe and Dickie (1957) concluded that bloodworm catches in Nova Scotia consist largely of three-year olds. Growing area conditions in Nova Scotia and Maine appear to be similar and observations made in Maine (Dow and Wallace 1955) agree with those of Canadian biologists.

Recent studies of Maine production and seawater temperatures as measured at Boothbay Harbor by the U. S. Fish and Wildlife Service suggest that abundance is determined primarily

Table 3 - Annual Sea Water Temperature and the Bloodworm Production Three Years Later

Year and Temp. in Declining Order		Number of Worms and Year Landed	
°F.	In Millions		
1953	51.9	7.5	1956
1951	51.5	10.6	1954
1954	50.2	10.5	1957
1955	50.1	13.6	1958
1949	50.1	9.2	1952
1952	50.0	8.9	1955
1950	49.6	11.2	1953
1957	49.0	24.2	1960
1947	48.5	13.7	1950
1956	48.5	18.8	1959
1960	47.8	32.2	1963
1958	47.3	26.1	1961
1946	47.2	17.7	1949
1945	47.0	25.0	1948
1959	47.0	25.7	1962
1948	46.7	9.5	1951
1944	46.5	7.2	1947
1943	45.3	2.6	1946

by the growth in the number of licenses issued from 449 in 1948 (the first year of issue) to 921 in 1963, but the inconsistency of any relationship between increased number of fishermen and landings precludes effort, in terms of number of fishermen, as the causative factor.

Table 2 - Maine Bloodworm Production and Number of Fishermen Harvesting Them

Year	Number of Fishermen	Number of Worms In Millions
1963	921	32.2
1962	775	25.7
1961	729	26.1
1960	643	24.2
1959	784	18.8
1958	628	13.6
1957	640	10.5
1956	530	7.5
1955	551	8.9
1954	625	10.6
1953	522	11.2
1952	435	9.2
1951	324	9.5
1950	389	13.7
1949	498	17.7
1948	449	25.0

by seawater temperature during the spawning year. Data presented in table 3 indicate an optimum annual temperature range of 47.0° to 49.0° F. during the year of spawning. Both higher and lower seawater temperatures are associated with substantial declines in worm landings.

These data are the only data which can be consistently used to account for fluctuations in abundance as indicated by commercial production. Deviations from high production levels between 47.0° and 49.0° F. which occurred in 1949 and 1950--although still higher than any other year outside the optimum range--can be accounted for by a bridge

and causeway construction project in those two years which drastically reduced tidal exposure in one major producing area. Estimates made independently by both the industry and the Maine Department of Sea and Shore Fisheries of annual production losses resulting from this construction ranged from 25 to 30 percent.

How seawater temperature influences the abundance of bloodworms is not understood. It may be a direct relationship in terms of larval and juvenile survival, or it may be indirect through its influence on the amount of biological activity in the growing area. Klawe and Dickie (1957) observed that bloodworms apparently do not occupy sediments which are not sufficiently stable to support burrows. Such conditions are frequently associated with increased organic activity during periods of high temperature. Conversely, during extremely cold winters greater ice overburden may create unfavorable sediment compaction in intertidal areas.



Fig. 3 - Packing bloodworms for shipment to dealers in bait for sport fishermen.

#### LITERATURE CITED

DOW, ROBERT L.

1951. Marine Worm Report, Maine Department of Sea and Shore Fisheries Department, bulletin.

DOW, ROBERT L., and DANA E. WALLACE

1955. Marine Worm Management and Conservation, Maine Department of Sea and Shore Fisheries Department, bulletin.

GANAROS, ANTHONY

1951. Commercial Worm Digging, Maine Department of Sea and Shore Fisheries Department, bulletin.

KLAWE, W. L., and L. M. DICKIE

1957. Biology of the Bloodworm, *Glycera dibranchiata* Ehlers, and Its Relation to the Bloodworm Fishery of the Maritime Provinces, Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Bulletin No. 115.



Created in 1849 the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



# TRENDS AND DEVELOPMENTS

## Alaska

### FOREIGN FISHING ACTIVITIES IN BERING SEA:

Early May 1964: U.S.S.R.: During the second week in May 1964, the Soviet trawling fleet concentrated west of Yakutat began dispersing and moving to other regions nearer Kodiak Island. The main concentration, which assembled on the Portlock Bank (much as in past years), was estimated to include 86 trawlers, 16 freezerships, 2 factoryships, and a few support vessels. A smaller segment of the Soviet trawl fleet was operating west of Icy Bay in May 1964, and included approximately 30 trawlers, 3 freezerships, and 1 factoryship. The region south and west of Kodiak in the vicinity of Chirikof Island was exploited in May 1964 by a smaller Soviet trawling fleet composed of less than 5 trawlers and 1 freezership. Observations indicated that the Soviet fleets in the Gulf of Alaska were concentrating on Pacific ocean perch.

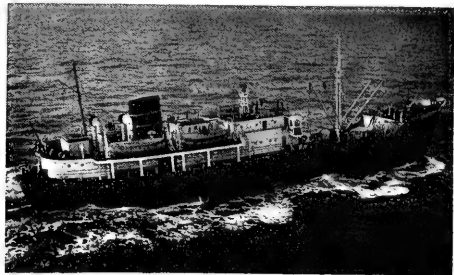


Fig. 1 - One type of Soviet factoryship operating in the North Pacific and Bering Sea. Length over-all about 150 feet with a speed of 10-12 knots.

The Soviet fleet fishing tangle nets for king crab continued to operate in the eastern Bering Sea in May 1964. That fleet consisted of 3 factoryships, each accompanied by twelve 40-foot picker boats and 2 SRT net-setting trawlers. The three Soviet king crab factory-

ships in the area were the Pavel Chebotnyagin operating north of Unimak Pass, and the Konstantin Sukhanov and the Vasily Blyukher, operating south of Hagemeister Island in outer Bristol Bay.

It is believed that two Soviet trawlers were still operating in May 1964 on the shrimp fishing grounds north of the Pribilof Islands and had been fishing in the area for over a month.

JAPAN: In May 1964, the shrimp factoryships Chichibu Maru and Einin Maru, each accompanied by 12 trawlers, continued to operate on shrimp grounds north of the Pribilof Islands.

During May, the Japanese tangle-net king crab fleet was reported to have been centered in outer Bristol Bay, north of Port Moller. That fleet consisted of 2 factoryships, the Tokei Maru and Tainichi Maru, each accompanied by 6 catcher vessels.



Fig. 2 - One type of Soviet trawler fishing in the North Pacific and Bering Sea.

The Fuji Maru No. 3, accompanied by 5 long-line fishing vessels, was believed to have been fishing in the region of the 100-fathom curve, southeast of the Pribilof Islands. The Kotoshiro Maru No. 25, with one accompanying long-line fishing vessel, presumably was

operating in the same area as the Fuji Maru No. 3 fleet.

The fish-meal factoryships Hoyo Maru and Gyokuei Maru, each accompanied by 30 trawlers, were operating in the eastern Bering Sea about 60 miles west of Amak Island.

Late May - Early June 1964: U.S.S.R.: During late May 1964, the large Soviet trawling fleet that built up off Yakutat had been shifting efforts between that area and the Portlock Bank region. As of early June, that fleet, estimated at 116 trawlers, 19 freezer-ships, 3 factoryships, 1 salvage tug, 1 tanker,



Fig. 3 - Japanese factoryship Tenyo Maru fishing in area west of St. Paul Island accompanied by 28 trawlers.



Fig. 4 - Washing silt and dirt from net loads of trawl-caught fish on the main deck of a typical Japanese factoryship.

The Tenyo Maru, accompanied by 28 trawlers, was reported fishing in the area west of St. Paul Island. The Tenryo Maru was reportedly fishing in the vicinity east of the Shumagin Islands. The stern-trawler Taiyo Maru No. 81 was located about 35 miles east of Cape Sitkinak, Trinity Islands.

Soviet and Japanese fishing activities in the Bering Sea continued into early June as follows:

and 2 cargo vessels, was again centered on Portlock Bank east of Kodiak. Observations and reports continued to indicate they were catching Pacific ocean perch with very small catches of other incidental species.

Soviet trawling effort appeared to be minimal in the area southwest of Kodiak, generally from Albatross Bank to Chirikof Island. A small fleet of about 4 trawlers and 1 reefer was fishing in that region.

The Soviet factoryship Konstantin Sukhanov and sisterships Pavel Chebotnyagin and Vasily Blyukher, each with at least two accompanying tangle-net setting trawlers, are continuing their operations on king crab in the Bering Sea north and east of Unimak Pass.

As of early June there was no confirmation that the two Soviet trawlers were still engaged in a shrimp fishery north of the Pribilof Islands. It was presumed that fishery might have been terminated.

**JAPAN: Shrimp Fishery:** The shrimp factoryships Chichibu Maru and Einin Maru, each accompanied by 12 trawlers, continued to operate on the shrimp grounds north of the Pribilof Islands. As of mid-June the side

trawler Tenryu Maru was believed to be still fishing for shrimp west of the Trinity Islands, southwest of Kodiak.

**King Crab Fishery:** The Japanese tangle-net fishery for king crab was reported to be centered in outer Bristol Bay, north of Port Moller. That fleet consisted of 2 factoryships, the Токеи Мару and Тайничи Мару, each accompanied by 6 catcher boats.

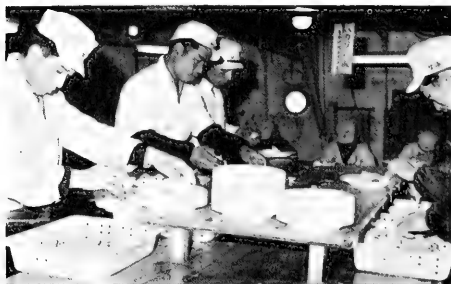


Fig. 5 - Sorting and weighing king crab meat prior to freezing aboard a Japanese crab factoryship.

**Long-Line Fishery:** Japanese press translations reported, the factoryship Fuji Maru No. 3, specially chartered to fish for halibut in the Area 3B North Triangle, was to return to Japan in late May and her five accompanying long-line vessels were to join the Seifu Maru fleet. Neither the Fuji Maru No. 3 nor the other Japanese halibut fishing fleet of the Kotoshiro Maru No. 25 and one accompanying long-line vessel were sighted during early June. It appeared likely that the Japanese disbanded their halibut fishing venture because of very poor fishing.

**Fish Meal:** The Japanese fish meal factoryships Hoyo Maru and Gyokuei Maru, each with 30 accompanying trawlers, were operating on the "flats" of outer Bristol Bay northwest of Port Moller. Other fleets licensed by the Japanese for fish meal, oil, and solubles production operating in the eastern Bering Sea the early part of June were the Tenyo Maru with 28 trawlers still working in the area northwest of St. Paul Island and the Soyo Maru and Seifu Maru each with 28 trawlers fishing just north of Unimak Pass. All 5 of those factoryships freeze selected portions of their catches for human consumption.

**Whaling:** Of the 3 whale factoryships which reportedly departed Japan on May 20 only one was sighted. The Kyokuyo Maru, probably

accompanied by 7 whale killers, was operating near Amchitka Pass in the western Aleutians. Another of the fleets, possibly the Nitto Maru, was expected to appear in the Gulf of Alaska region between Kodiak and Dixon Entrance.

**"Exploratory" Fishing Activities:** The Japanese factory stern trawler Taiyo Maru No. 81 was last sighted about 70 miles west of Middleton Island in the central Gulf of Alaska. This vessel was primarily seeking Pacific ocean perch and was reportedly been experiencing good catches.

A second Japanese stern factory trawler in the Gulf, the Akebono Maru No. 51, moved from the Shumagin Islands region eastward into the area about 40 miles west of the Trinity Islands, southwest of Kodiak. Japanese "exploratory" efforts in 1963 reported sizeable catches of sidestripe and pink shrimp--the main species sought by that vessel.

**Groundfish Freezing Fishery:** The stern factory trawler Ibuki Maru and one accompanying smaller side trawler were licensed by Japan to engage in the groundfish fishery of the Bering Sea in 1964. About early June this vessel appeared north of Amchitka Pass in the western Aleutians. It was believed that the bulk of catches made by both vessels was being frozen aboard the factory trawler.

Note: See Commercial Fisheries Review, June 1964 p. 9.

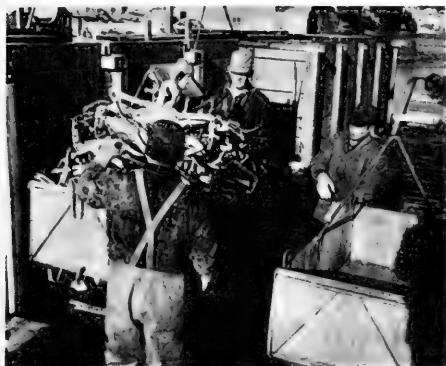
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#### PLANS OF KING CRAB PROCESSORS:

A number of Alaska's seafood processors plan to rebuild following the March earthquake. One processor, whose plants suffered little direct damage due to the earthquake and tidal waves, must raise his shore plants at Port Wakefield and at Seldovia due to land subsidence. A King crab operator at Kodiak plans to replace its shore plant there with facilities aboard a 160x60 foot barge. That firm does not plan to rebuild its Shearwater salmon cannery, but will maintain a company store and gear storage at the old Shearwater cannery site. Another firm plans to rebuild its plant at Kodiak but details were not yet available. Two other king crab plants damaged by the earthquake were back in production by the end of May, but the crab supply was limited. A shrimp processing plant resumed its production of shrimp logs.

Other developments in Alaska's king crab fishery indicated significant expansion west





Unloading king crab at a cannery in Kodiak before the March 1964 earthquake.

of Kodiak. One major processor plans to convert from canning to freezing in the Shumagin Islands area. Significant new fisheries have developed on the Slime Bank in the Bering Sea and in waters surrounding Unalaska Island.

\* \* \* \* \*

#### NEW BARGE FACILITY AT KETCHIKAN BEING BUILT:

A contract was awarded in May to a building firm for construction of a highly versatile barge docking installation at Ketchikan and Northern Terminal Company's \$1.5 million rail-water terminal and industrial park at Ketchikan in Southeastern Alaska.

The new facility will be parallel to the Company's modern rail-barge basin and transfer span and will accommodate barges up to 200 feet in length. Rail trackage will be extended onto the new dock and a large ramp to the inshore end of the basin will provide full roll-on, roll-off capabilities.

As a result handling of cargo will be greatly facilitated on freight moving through the terminal to or from Southeastern Alaska points. Such commodities as lumber, ores, and canned salmon may be transferred by crane directly from a barge to a railcar for shipment to markets in the other states. Work was scheduled for completion July 1, 1964.

\* \* \* \* \*

#### HERRING ROE READIED FOR SHIPMENT TO JAPAN:

The first 1964 shipment of herring roe to Japan was reported to be about 10 tons. The roe will be brine-cured and shipped to Japan in boxes where it will be placed on the domestic market. The product was being handled by a subsidiary of a leading Japanese fishing firm. The fishing and primary processing of the catch was to be done in Alaska by Alaskans.

\* \* \* \* \*

#### GEAR COUNT FOR SOUTHEASTERN ALASKA REGISTERED FISHING VESSELS:

A gear count has been completed for Southeastern Alaska purse-seine and gill-net vessels registered for 1964. The purse-seine gear count shows that gear is equally divided between residents and nonresidents and the number increased by 2 over the past 3 years. Gill-netting is down somewhat over the past three years.

Registrations for 1964 as compared with prior years are:

##### Purse Seine:

1964	.....	resident 243; nonresident 243; total 486.
1963	.....	resident 252; nonresident 232; total 484.
1962	.....	resident 247; nonresident 250; total 497.
1961	.....	resident 245; nonresident 206; total 451.

##### Gill-Netting:

1964	.....	resident 204; nonresident 166; total 370.
1963	.....	resident 287; nonresident 164; total 451.
1962	.....	resident 242; nonresident 168; total 410.
1961	.....	resident 251; nonresident 169; total 420.

Gill-net fishing opened in the Taku-Stikine area April 27 and was scheduled to open in Portland Canal on June 14 and Red Bay-Lake Bay and Lynn Canal on June 15.

\* \* \* \* \*

#### LOW INTEREST RATE LOANS AVAILABLE TO FISHING INDUSTRY:

Emergency loans from the Fisheries Loan Fund of the U.S. Bureau of Commercial Fisheries have been made at an interest rate of 3 percent to fishermen who had fishing vessels or gear lost or damaged in the Alaska earthquake and resulting tidal wave. Applications for loans of that type at this interest rate will be accepted by the Bureau until September 30, 1964.

\* \* \* \* \*

### DENIAL OF PETITION FOR REHEARING ON ALASKA STEAMSHIP SEASONAL CARGO RATES:

The Federal Maritime Commission has ruled that the Alaska Steamship Company must lower its rates by about 2.7 percent to 6.4 percent in the seasonal Alaska trade to avoid receiving a rate of return in excess of 10 percent.

The Alaska Steamship Company had increased rates in late 1961 by 10 percent on general cargo to seasonal areas of Alaska, 20 percent on cannery supplies to Alaskan salmon canners, and 10 percent on salmon cannery products southbound. The Commission started an investigation of the rates in January 1962. In a decision dated March 5, 1964, the tariffs were ordered amended to bring the Alaska Steamship Company a rate of return not in excess of 10 percent in the seasonal service.

The Alaska Steamship Company petitioned the Commission for rehearing of the proceeding, contending that the rate base used by the Commission was not proper. The State of Alaska and the General Services Administration supported the Commission's decision. The Commission denied the petition for rehearing on May 13, 1964, thereby making the decision final. The denial carried with it specific increases. The Commission said it would allow 3.6 percent and 7.3 percent northbound on general cargo and salmon cannery supplies, respectively, and 3.6 percent southbound on salmon cannery products.

Although salmon cannery traffic accounts for over 90 percent of the traffic moving under the contested rates, no Alaska salmon canners took part in the proceeding. The U.S. Bureau of Commercial Fisheries participated, but took no position.



### Alaska Fisheries Exploration and Gear Research

#### CHARTERED EXPLORATORY VESSEL BEGINS ACTIVITIES:

The chartered exploratory fishing vessel *Paragon* arrived in Juneau on May 24, 1964, to begin a 4-months charter period to the U.S. Bureau of Commercial Fisheries for exploratory fishing in the area from Kodiak Island westward. After departing Juneau on May 25,

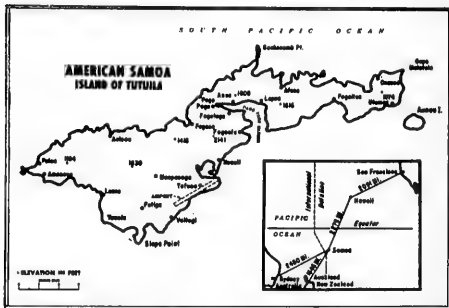
the vessel proceeded en route to Kodiak. Radio-telephone communication the following day revealed that the vessel had struck a "log" and that some damage resulted to the main engine cooling system. She was later "beached" at Port Wakefield when repairs were made to the cooling system. Later reports indicated the *Paragon* was conducting underwater television experiments in the Kupreanof-Rasperry Straits area of Kodiak Island.



### American Samoa

#### EX-VESSEL PRICES FOR TUNA:

The Japanese trading and fishing firms which have been negotiating tuna ex-vessel prices with the United States tuna packing



firms located in American Samoa reached an agreement in mid-May 1964. Prices agreed on are as follows (in short tons): frozen albacore \$325; iced albacore \$310; frozen gilled-and-gutted (head on) yellowfin \$275; frozen dressed (gilled-and-gutted, head and tail off) yellowfin \$285; iced small (20-80 lbs.) round yellowfin \$250; iced medium (80-100 lbs.) round yellowfin \$210; iced large (over 100 lbs.) round yellowfin \$170. (Suisan Tsushin, May 18, 1964.)

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#### JAPANESE FISHING FIRM TO CHARGE HANDLING FEE FOR DELIVERIES TO CANNERY:

One of Japan's leading fishing companies began on July 1, 1964, to assess a flat fee of 8 percent on tuna that it handles for delivery to a United States tuna packing company on American Samoa. Previously, the Japanese fish-



Tuna cannery on American Samoa operated by a United States west coast tuna canning firm.

ing company had bought the fish directly from Japanese fishing vessels operating out of American Samoa and resold them to one of the American canneries on the island. (Suisancho Nippo, June 1, 1964.)

Ula

## California

### SEA OTTER POPULATION DETERMINED BY CENSUS:

An aerial survey of California's sea otter population, made in February 1964, disclosed there are at least 396 of the animals, the California Department of Fish and Game announced in June 1964. The census, taken in the Department's twin engine Beechcraft N5614D, was made at heights of 50 to 150 feet, and visibility was excellent.

The sea otter census was conducted along the coastline between Morro Bay and Monterey Bay. It was the third of three flights planned for the census and was reported to have resulted in the best sea otter count of the three flights.

This year's (1964) census of 396 sea otters is substantially below the 638 figure recorded in the last official census taken in 1957. The Department pointed out that natural mortality does take a toll regularly, because sea otters are very susceptible to injury from a rough surf and from their natural enemies--white sharks and killer whales. The 1964 census of a minimum of 396 animals does point out, however, the necessity of continued protection of that valuable animal because it is not yet present in large enough numbers to guarantee survival, the Department stated.

Sea otters are protected by State law within the 3-mile limit and by Federal law outside the 3-mile limit.

Note: See Commercial Fisheries Review, May 1964 p. 13, April 1964 p. 12.



## Cans

### SHIPMENTS FOR FISHERY PRODUCTS, JANUARY-APRIL 1964:

A total of 840,463 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-April 1964, an increase of 2.6 percent over the 819,096 base boxes used during the same period in 1963.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14"x20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

\* \* \* \* \*

### NEW EASY-OPEN ALUMINUM CAN DEVELOPED FOR MAINE SARDINE INDUSTRY:

A good portion of the United States 1964 Maine sardine pack will go to market in a new easy-open aluminum can, according to the Maine Sardine Council. In overall appearance, the new can closely resembles the standard rectangular sardine can, but the cover is equipped with a tab that embodies the features of the lift-tab beer can and the easy-opening citrus concentrate can. (Canning Trade, June 1, 1964.)



## Caroline Islands

### COMMERCIAL FISHERIES PROJECT AT PALAU MAKES HEADWAY:

Construction of a commercial fisheries project at Palau, in the Caroline Islands Group of the United States Trust Territory of the Pacific, has been under way this past year. In April 1964, material and equipment for building a cold-storage freezer plant and other facilities connected with the project arrived in Palau. The project was initiated in 1963 under an agreement with a United States west coast tuna canning firm as a major step toward large-scale development of a commercial fishery--the most important natural resource of the Trust Territory.

In a statement to the Trusteeship Council in May 1964, the High Commissioner of the Trust Territory gave a resume of significant economic events in that area. It included developments toward the establishment of a commercial fishery which could well lead to similar enterprises in other districts of the Territory, and thus stimulate the local economy through increased employment and a higher level of income.

The High Commissioner said that one of the provisions of the agreement with the United States firm calls for the training of Micronesians as tuna fishermen and in the installations ashore where it is anticipated that some 60 or more Micronesians will be employed in the initial phases. Six 25-ton tuna vessels were being built and were expected to begin operating from Koror in Palau by July 1, 1964. Initially 48 Micronesians were to be employed as crew members. Local contractors in Palau participated in the construction of a living quarters building to house some 120 tuna fishermen. Other facilities to be built or installed include a 1,500 ton fish-storage freezer, ice-making machines, water storage tanks, offices, and houses for technical and management staff.

The Trust Territory Administration continued to send trainees to Hawaii to learn live-bait tuna fishing. As of May, some 23 trainees were undergoing training on tuna vessels operating out of Hawaiian ports and others will be given similar opportunity. The High Commissioner said it is from that group of trainees that they hope to develop a nucleus of experienced tuna fishermen which can, in turn, train other Micronesians at the local level.

Most of the pilot projects in local fisheries development have, up to now, been concentrated in Palau. With the establishment of a large-scale commercial fisheries venture in Koror, it is now proposed to establish a pilot fisheries project in the Truk District. This will permit the transfer of the major fisheries development effort to Truk where initial emphasis will be given to the development of a fishing industry capable of supplying all local demands for fresh fish. A Fisheries Officer of the Trust Territory will still remain in Palau to supervise the fisheries program but at that stage it is felt that major emphasis must be given to the establishment of fishery facilities in Truk, the Territory's largest district. Recruitment of additional fisheries development personnel is also being planned for the coming year.

Boat building operations in Palau were reported being increased. The Palau Boat-builders Association during the year completed and sold more than a dozen vessels while an additional 15 vessels are on order. The Palau Boat Yard has been established as a Government pilot project under the Administration Boat Builder and this past May had under construction a 75-foot live bait tuna vessel for the local fisheries project. The Palau Boat Yard will also be used as a training center for advanced training for boat-builders from all over the Territory. (Press Release of U.S. Mission to the United Nations, May 28, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 85.



## Central Pacific Fisheries Investigations

### BEHAVIOR STUDIES OF LITTLE TUNA:

Swimming speed of little tuna decreases over a 5-day period of food deprivation only to increase again after a meal, it was observed in behavior studies made by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. The density of their food is greater than sea water and following a meal the weight of the whole fish in water increases. This increase in speed and weight in water are apparently associated mechanically with the increased speed resulting in an increase in lift from the pectoral fins, and therefore a compensation for the increase in weight. These data plus data on the occurrence of gas bladders in scombrid species with different maximum attained weights

were presented to the Hawaiian Academy of Science.

The visual acuity of two humans were measured under the same conditions as previously collected data on little tuna and skipjack. When the visual stimulus has a brightness of 1 foot lambert, visual acuity is 0.11 for little tuna, 0.15 for skipjack, and 0.30 for man with a face plate. This means that man can see an object  $\frac{1}{3}$  and  $\frac{1}{2}$  the size that can be seen by little tuna and skipjack, respectively, under the same conditions. These data have not yet been corrected for the distortion of the image by the water column.

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#### TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

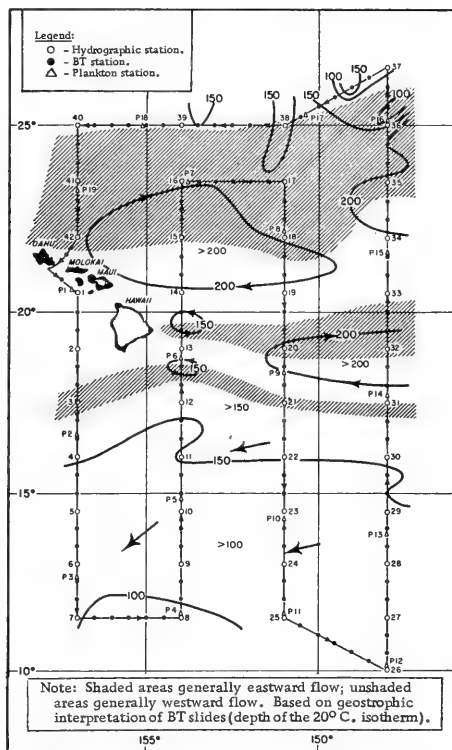
M/V "Townsend Cromwell" Cruise 3  
(April 12-May 4, 1964): To determine the rates of change in the distribution of properties in the trade wind zone of the central North Pacific was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell. The cruise was the third in a series of oceanographic cruises designed to investigate the relationship between wind and ocean currents.

A total of 42 oceanographic stations were occupied along the cruise track as shown in chart. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters.

Bathythermograms (BT) were obtained at 20-mile intervals along the cruise track. Between stations 19 and 21, 26 and 28, 35 and 37, BT casts were made at 10-mile intervals. Surface bucket temperatures and water samples for salinity analysis were obtained at each bathythermograph observation. BT data were coded and transmitted four times daily to Fleet Numerical Weather Facility, Monterey, Calif.

At station 24, subsurface currents were measured, using an Ekman meter, while drifting relative to a parachute drogue set at 1,200 meters.

Ten plastic enclosed drift cards were released at 30-mile intervals along the entire cruise track and standard marine weather observations were made and transmitted daily at 0000, 0600, 1200, and 1800 G.M.T. Radiation from sun and sky was measured and re-



Cruise track of M/V Townsend Cromwell Cruise 3 (April 12-May 4, 1964).

coded daily by an Eppley pyrheliometer. Colored photographs of cloud formations were made.

Surface plankton tows lasting one-half hour were made using a 1-meter net at 2,000 daily. Flying fish found aboard the vessel were collected and preserved in formalin.

A standard watch for bird flocks and fish schools was maintained during daylight hours. Observers from the Smithsonian Institution on this cruise maintained their own watch for birds.

Field plots of the temperature distribution in the upper 250-meter depth obtained from BT's indicated that both the thermocline structure and also the inferred geostrophic

flow pattern were undergoing a change from the patterns observed during the February and March 1964 cruises.

As on the previous cruises, westerly flow predominated south of  $18^{\circ}$  N. and an irregular flow pattern existed north of  $18^{\circ}$  N. However, the pronounced eddy west of the island of Hawaii and a larger counterclockwise eddy encircling that Island (present during the two previous cruises) were not apparent on this cruise. The most significant change occurred along the sections  $148^{\circ}$  and  $151^{\circ}$  W. between  $15^{\circ}$  and  $20^{\circ}$  N. Here the thermocline increased in depth. This, together with the geostrophic interpretation of the depth of the  $20^{\circ}$  isotherm distribution, indicates that new water is feeding into the region between  $15^{\circ}$  and  $20^{\circ}$  N., progressing westward at about 6 miles a day. It is believed that this is associated with the spring intensification of the California Current Extension.

The surface temperature ranged from about  $26^{\circ}$  C. ( $78.8^{\circ}$  F.) in the southern portion of the cruise area to  $21^{\circ}$  C. ( $69.8^{\circ}$  F.) in the northeast portion. South of  $16^{\circ}$  N., the isotherms aligned zonally, whereas, north and east of the Islands they aligned in a north-west-southeast direction.

Bird flocks and related fish schools were predominantly sighted south of  $13^{\circ}$  N. Large numbers of birds sighted along  $25^{\circ}$  N. during the previous cruise were not sighted during this cruise.

A two-day interval (April 18-20) during this cruise period was spent at Hilo, Hawaii, to conduct a ship's open house and educational exhibit.

Note: See Commercial Fisheries Review, July 1964 p. 10, May 1964 p. 13.

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#### OCEANIC EDDIES SOUTHWEST OF HAWAIIAN ISLANDS STUDIED:

M/V "Charles H. Gilbert" Cruise 72-- PHASE I (April 14-21, 1964); PHASE II (May 16-23, 1964): Oceanic eddies in an area southwest of the Hawaiian Islands were studied on this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The cruise was conducted as two separate phases, each lasting about eight days.

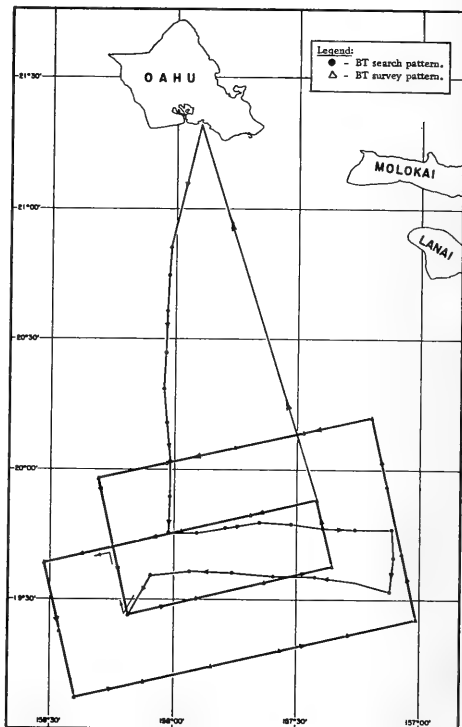


Fig. 1 - Phase I of M/V Charles H. Gilbert Cruise 72, April 14-21, 1964.

During Phase I of the cruise, a large eddy with a radius of about 70 miles was located due west of the island of Hawaii and due south of Oahu. Its position and thermal structure was studied as planned until engine trouble ended the Phase I portion of the cruise. Salinity samples were collected with each bathythermograph (BT) observation.

No drift cards were released during Phase I due to its premature ending.

During Phase II, the eddy which was studied during Phase I could not be located, although a thermal dome was encountered about 60 miles southwest of Oahu. A study was carried on in the area where the eddy may have moved since Phase I. BT observations were made every hour and salinity samples

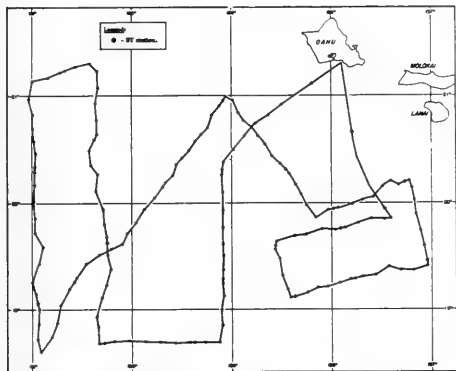


Fig. 2 - Phase II of M/V Charles H. Gilbert Cruise 72, May 16-23, 1964.

obtained with each BT. A rerun of the pattern of BT observations was made in about the same locations as Phase I. Preliminary studies of the two patterns showed no resemblance of thermal topography in that area.

A total of 420 drift cards and 157 driftbot-tles were released during Phase II.

A watch was kept for fish schools and bird flocks during both phases. A considerable large number of birds were seen, but the fish schools could not be identified.

During both phases the thermograph and barograph were operated continuously, and standard marine weather observations were transmitted four times daily.

Two lures were towed during daylight hours. The total catch consisted of 2 mahimahi (Coryphaena hippurus), 2 yellowfin tuna (Neothunnus macropterus), and 1 wahoo (Acanthocybium solandri).

Note: See Commercial Fisheries Review, August 1963 p. 21.



## Clams

### NEW LABORATORY HOLDING METHOD:

A new method for holding soft-shell clams in laboratory tanks is employed by the U.S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine. A square wooden frame covered with an 8-inch mesh saran screen is used. The screen is

cut into slits, each large enough to hold one clam upright. The tension on the screen provides support for the clam valves, helping to hold them closed.

The advantages of the method are: (1) clams are held in a natural upright position to permit siphoning observations or measurements; and (2) support is provided for the valves, and relaxation for the adductor muscles without burying the clams in mud or sand.

Preliminary results have been satisfactory, and clam survival is being observed in comparative studies of the new holding equipment and the usual alternatives of holding clams free on tank bottoms or buried in sand.



## Crabs

### EFFECTS OF CERTAIN PYROPHOSPHATES ON MOISTURE RETENTION IN CANNED KING CRAB:

The U.S. Bureau of Commercial Fisheries Technological Laboratory, Ketchikan, Alaska, is conducting a short applied study of the effects of pyrophosphates on moisture retention by canned king crab. (The National Cannery Association is studying polyphosphates from the standpoint of struvite control.) Three experiments have been completed. Sodium acid pyrophosphates and sodium tripolyphosphate were used in concentrations ranging from 0.15-0.59 percent (with respect to  $P_2O_5$ ) expressed as a percentage of the fill weight of crab meat. The polyphosphates to be added were included in a brine solution totaling about 50 grams. Other variables under consideration are the pH of the polyphosphate solution, sodium chloride level, and the initial cooking procedures necessary for proper shucking and color retention of the king crab meat.

Preliminary results suggest that polyphosphates used in amounts similar to those proposed for control of struvite in canned king crab can reduce shrinkage during retorting but do not cause the crab meat to absorb additional water. Additional experiments have been planned to verify earlier results and suggest whether the experiments should be continued further.



## Federal Aid for Sport Fish and Wildlife Restoration

### INTERIOR APPORTIONS FUNDS TO STATES FOR FY 1965:

A preliminary distribution of \$14.2 million in Federal-aid funds for fish and wildlife restoration projects was made available to the states on July 1, 1964, Secretary of the Interior Stewart L. Udall announced on June 4, 1964. This is an increase of \$1.6 million over a similar distribution a year earlier.

Of the \$14.2 million allocated so far this year, \$10.9 million is for wildlife restoration and \$3.3 million is for sport fishing projects. The preliminary apportionments enable states with small reserve funds to finance their Federal-aid operations from July 1 until the final apportionment for the year which comes in the fall.

Fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment. Distribution of the funds is based on the number of paid license holders in a state and on the state area. The Federal Aid in Fish and Wildlife Restoration programs are administered by the Interior Department's Bureau of Sport Fisheries and Wildlife.

Under the Federal-aid programs, states spend their own funds on approved projects and are reimbursed for up to 75 percent of the cost. The laws establishing the programs also provide \$10,000 each for Guam, Puerto Rico, and the Virgin Islands. The total 1965 Fiscal Year apportionment for those areas is included in the July 1, 1964, preliminary apportionment.

Note: See *Commercial Fisheries Review*, July 1963 p. 36.



## Federal Purchases of Fishery Products

### DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1964:

**Fresh and Frozen:** For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in May 1964 than in the previous month. The increase was 27.5 percent in quantity and 24.4 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, May 1964 with Comparisons

QUANTITY				VALUE			
May		Jan.-May		May		Jan.-May	
1964	1963	1964	1963	1964	1963	1964	1963
..... (1,000 Lbs.) .....				..... (\$1,000) .....			
2,211	1,752	10,735	9,854	1,123	938	5,581	5,695

Compared with the same month in the previous year, purchases in May 1964 were up 26.2 percent in quantity and 19.7 percent in value due mainly to larger purchases of shrimp and scallops. The gain was partly offset by smaller purchases of most fish fillet items.

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, May 1964 with Comparisons

Product	May		Jan.-May	
	1964	1963	1964	1963
..... (Pounds) .....				
<b>Shrimp:</b>				
Raw headless	109,700	1/	524,350	1/
Peeled and deveined	101,262	1/	377,470	1/
Breaded	399,450	1/	1,853,550	1/
<b>Total shrimp</b>	<b>610,412</b>	<b>450,965</b>	<b>2,755,370</b>	<b>2,509,969</b>
<b>Scallops</b>	<b>483,750</b>	<b>169,851</b>	<b>1,394,100</b>	<b>945,819</b>
<b>Oysters:</b>				
Eastern	51,070	1/	402,490	1/
Pacific	12,044	1/	105,164	1/
<b>Total oysters</b>	<b>63,114</b>	<b>66,832</b>	<b>507,654</b>	<b>498,699</b>
<b>Clams</b>	<b>4,675</b>	<b>20,414</b>	<b>141,533</b>	<b>119,584</b>
<b>Fillet:</b>				
Cod	23,850	61,888	196,616	299,941
Flounder and sole	196,000	266,292	510,816	1,533,824
Haddock	185,390	197,504	2,862,814	1,046,574
Ocean perch	275,800	327,352	1,523,020	1,661,972
<b>Steaks:</b>				
Halibut	104,927	111,882	528,722	612,480
Salmon	25,652	19,570	90,629	89,495
Swordfish	810	2,642	6,820	13,872

1/Breakdown not available.

2/Includes 8,650 pounds of haddock portions.

Total purchases in the first 5 months of 1964 were up 8.9 percent in quantity from those in the same period of 1963, but down 2.0 percent in value because of generally lower prices. In January-May 1964, there were larger purchases of shrimp, scallops, and clams, but noticeably lower purchases of cod fillets, haddock fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

**Canned:** In the first 5 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 54.0 percent in quantity and 58.6 percent in value from those in the same period of the previous year. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.



Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, May 1964 with Comparisons

Product	QUANTITY				VALUE			
	May		Jan.-May		May		Jan.-May	
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	383	465	1,842	1,463	170	217	815	723
Salmon	-	8	679	14	-	5	416	9
Sardine	20	53	127	242	49	22	90	101

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, July 1964 p. 11.



## Fish-Farming

### LABOR-SAVING GEAR TESTED IN RICE-FARM PONDS:

Several types of fishing gear new to inland fish farmers were successfully tested in rice-farm fish ponds near Dumas, Ark., in early 1964 by U.S. Bureau of Commercial Fisheries technicians.

A 2,000-foot nylon haul seine successfully harvested nearly 5,000 pounds of buffalofish and an undetermined number of small crappie in one haul from a 39-acre pond. The catch was estimated to include 50 percent of the buffalofish known to be stocked in the pond. An elevator-conveyor belt designed to move the fish catch from the net to a waiting truck also proved successful when the net was emptied of the 2.5-ton catch in about 1 hour.



Fig. 1 - This labor-saving method of removing buffalofish from a rice-farm fish pond by means of a fish elevator was successfully demonstrated to local fish farmers.

In another series of tests, slat traps were set in a fish pond to determine their effectiveness

for catching a relatively small number of catfish for marketing on short notice. Daily lining of the traps indicated two factors which apparently affect the catch rate of the trap gear. One is the effect of movements of local weather frontal systems, and the other is the decoying effect of captured catfish attracting others to the same trap. One catch of 121 pounds of channel catfish made during a 48-hour set emphasized the decoying effect. Over one-half of the fish were taken from 1 of the 10 traps set, and it was jammed so full that 1 more fish could not have forced through the opening. Such behavior is successfully used in other fresh-water fisheries to improve gear efficiency. The reactions of catfish will be studied further during future slat-trap operations.



Fig. 2 - Catfish in a rice farm fish pond are being concentrated in a small area with a seine-type gear preparatory to removing them from the pond.

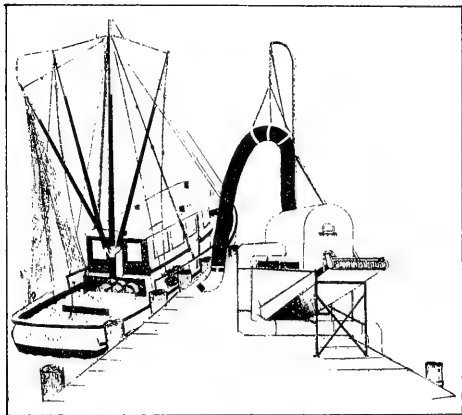
The tests were conducted as part of a gear-development project to assist the farm-pond fish operators to economically harvest fish raised for the commercial market.



## Fish Handling

### AIR PUMP FOR UNLOADING FISH:

An air pump to unload fishing vessels is offered by a Texas company. The pump is available in varying capacities to fit different operations. The manufacturer states, "Basically, this new unit operates on a vacuum dry-air suction principle, utilizing a light-weight rubber suction hose that is lowered into the hold of the trawler, through which the product is air-lifted into a vacuum chamber and discharged into a standard-type wash tank equipped with a conveyor belt to remove the product from the tank. No water is required in the hold of the trawler." The manufacturer claims: (1) this method of unloading requires only one man to lower the hose into a vessel and to do such raking as is necessary



to keep a steady flow of product being air-lifted into the tank; (2) the unit does not damage fish or shellfish in any manner and actually eliminates the damage normally done through shoveling as when unloading by basket or barrel methods; and (3) capacity per hour has proven very satisfactory with a low maintenance cost.



## Fish Kills

### FISH KILLS BY WATER POLLUTION IN 1963:

Water pollution killed more than an estimated 7.8 million fish during 1963, reported the U. S. Public Health Service on June 5, 1964. This is an increase of 750,000 fish over the estimated water-pollution fish kill reported in 1962. Industrial operations, the largest identified cause of fish kills, accounted for almost 3.2 million dead fish. Municipal sewage, the second most common cause, killed more than 1 million fish, and agricultural operations caused more than 760,000 fish deaths.

The U. S. Public Health Service does not specify the number of fish that died in the 1963 heavy fish kill on the lower Mississippi River in Louisiana. At the time the State of Louisiana reported the kill it was not known whether the deaths were natural or caused by pollution. The cause of the fish kill has since been found to be endrin (a pesticide).

Eight states did not submit reports on fish kills. Three states reported no known kills occurring in their areas.

In addition to the massive fish kills in Louisiana, three other large fish kills were reported in 1963. An estimated 2 million fish were killed in the Wahiawa Reservoir on Oahu Island in Hawaii. The fish were reported dying in a limited area of the reservoir in the vicinity of the Wahiawa sewage treatment plant. Although the plant gives complete treatment to its sewage, there is a possibility that some toxic substance may have been discharged, but it was not proved.

An accidental spill of lethal quantities of resin acid soaps from a paper company near Weldon, N. C., killed about 100,000 fish. The spill lasted for 8 minutes and dumped between 10,000 and 15,000 gallons of the wastes, affecting more than 100 miles of the Roanoke River.

The third large fish kill in 1963 occurred in the Coweeman River near Kelso, Wash., where an accidental break in a hose dumped 4,000 gallons of Diesel oil into the river. Fish were completely destroyed or severely damaged along a 10- to 13-mile stretch of the river and an estimated total of 59,000 fish were killed.

More than 2,200 miles of river and more than 5,600 acres of lakes were involved in the fish kills reported for 1963.

Note: See Commercial Fisheries Review, July 1963 p. 50.



## Fur Seals

### MODIFIED TAGGING TECHNIQUES SUGGESTED TO PREVENT EXCESS MORTALITY:

The possible reason why the mortality rate of tagged fur seal pups is higher than that of untagged pups has been indicated by dissection studies by the U. S. Bureau of Commercial Fisheries Marine Mammal Laboratory in Seattle, Wash. Special attention to the arm and flipper revealed that vital blood vessels and "swimming" muscles make up the site where tags for population studies are normally attached. In view of that finding, research biologists tagging or marking other animals may wish to examine their marking and tagging techniques.



## Gear

### MIDWATER TRAWL TESTS SUCCESSFUL IN PACIFIC COAST HAKE FISHERY:

The first successful use of an experimental midwater trawl to capture large quantities of hake may be a major breakthrough in the establishment of a new commercial fishery off the Pacific Coast of the United States, Secretary of the Interior Stewart L. Udall announced on May 29, 1964. The use of such gear to catch hake (a species related to East Coast whiting) indicates the feasibility of commercial harvesting of this abundant but presently unused West Coast resource, the Interior Secretary added.

The trawl (a net with an 80-foot by 80-foot oval opening which fishes in the mid-depths of the ocean) was developed by fishing gear specialists of Interior's Bureau of Commercial Fisheries Regional Office at Seattle, Wash. It is many times larger than nets commonly used by United States commercial fishermen.

A significant factor in recent tests of the new trawl was that it was used on a standard commercial trawler, the *St. Michael*, a 75-foot vessel operating out of Bellingham, Wash., indicating the adaptability of the present West Coast fishing fleet to this type gear. The *St. Michael*, chartered by the Bureau of Commercial Fisheries, made four one-hour drags during the test in depths of from 50 to 60 fathoms (300 to 360 feet). The catch amounted to 8,200 pounds on the first trawl, 30,000 pounds the second, 42,000 the third, and 60,000 the fourth. The fish were located by an echo-sounder southwest of Destruction Island off the north coast of Washington. They averaged about 22 inches long and weighed from 2 to 3 pounds each.

Scientific studies have shown that hake is the most prolific fish along the Pacific Coast, Secretary Udall said. Hake can be used as a food fish, makes a high quality white fish meal for animal and poultry feeds, and has great potential for use in the manufacture of fish protein concentrate.



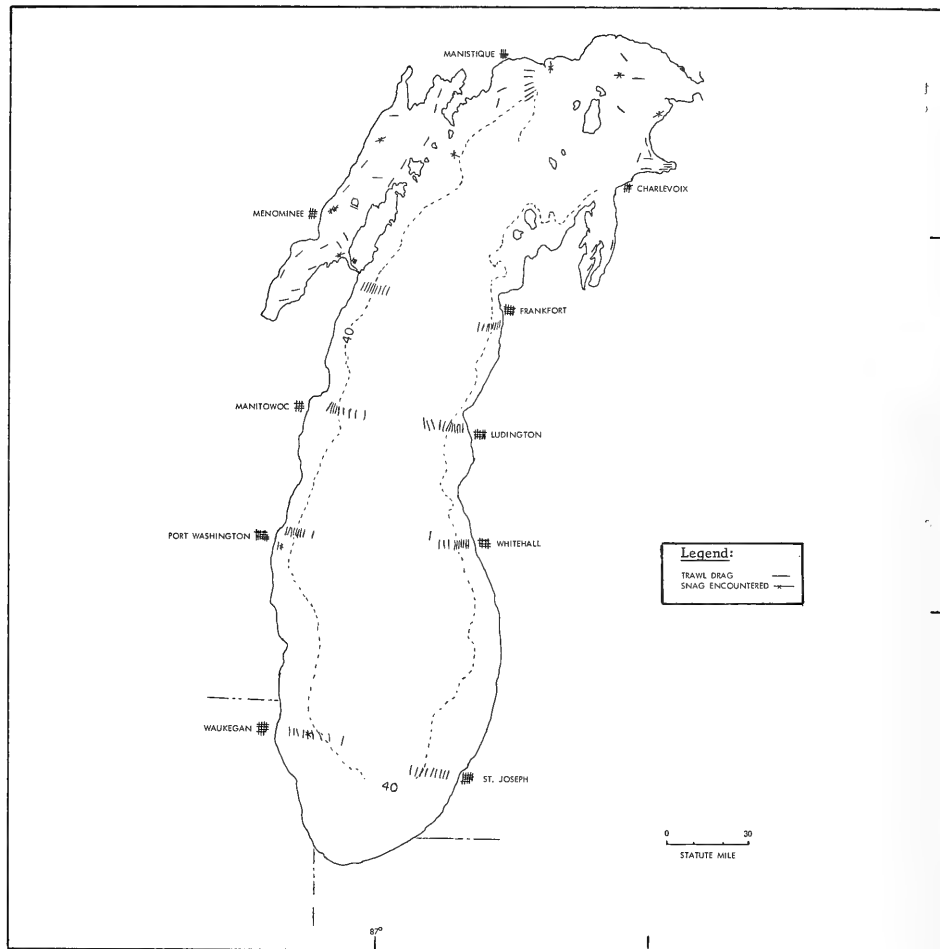
## Great Lakes Fisheries Exploration and Gear Research

### SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE AND CHUB STOCKS IN LAKE MICHIGAN CONTINUED:

M/V "Kaho" Cruise 17 (April 28-May 22, 1964): To extend knowledge of the seasonal distribution and abundance of alewife and chubs and their availability to bottom trawls was the primary purpose of this cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel *Kaho* between April 28-May 22, 1964--a period not previously studied in this portion of the Great Lakes. (The establishment of fish meal plants in Wisconsin recently has created a demand for large, inexpensive supplies of fish. Although spawning alewife are usually readily available to traditional Great Lakes fishing gear from May to August, trawling will be relied upon to furnish fish economically for fish meal plants during other periods of the year.) Secondary objectives of the cruise were to collect length-frequency data for chubs and alewife, and samples of various species for laboratory analysis relating to special studies.

Excellent catches of alewife were taken in all areas fished in southern Lake Michigan except off Ludington. In northern Lake Michigan and Green Bay, alewife were widely scattered and significant catches were made only off Sturgeon Bay and in Grand Traverse Bay. Good catches of chubs were taken off Waukegan and Arcadia. With the exception of a few catches of smelt and white suckers, other species were not taken in significant amounts.

**FISHING OPERATIONS:** A total of 135 trawl drags were completed with a 52-foot (headrope) fish trawl in 20 days of exploratory operations. Of the total, 66 drags were completed in southern Lake Michigan, 46 in northern Lake Michigan, and 23 in Green Bay. At each fishing location in the open lake, paired drags were made in opposite directions at a preselected depth to determine the optimum towing direction for making all other drags in the area. Drags were of 30 minutes duration except for 14 which were terminated



Lake Michigan explorations, M/V Kaho Cruise 17 (April 28-May 22, 1964).

early due to the presence of rough bottom or set nets and 4 others which were terminated after 15 minutes because of the large quantities of alewife being taken.

Although snags were encountered, net damage was relatively minor. Bottom topography and bathymetric distribution of fish were continuously monitored and recorded with a high-resolution echo sounder.

**FISHING RESULTS:** Southern Lake Michigan: Fishing results at stations off opposite shores in the southern portion of the Lake revealed substantial differences in species interrelationship and availability. Excellent catches of alewife were taken at various depths in each area except off Ludington, where catches of all species were insignificant, possibly due to severe weather conditions immediately preceding the exploratory

fishing effort. The best catch rate for alewife was experienced off Port Washington at 10 fathoms, where 1,500 pounds of alewife were caught in a 5-minute drag. At other fishing stations in southern Lake Michigan, the best catches of alewife ranged from 1,340 to 3,800 pounds per drag.

Good catches of chubs (ranging from 300 to 1,130 pounds) were taken at 40 fathoms off Benton Harbor, at 25 to 45 fathoms off Waukegan, at 25 and 35 fathoms off Port Washington, and at 35 and 40 fathoms off Manitowoc. Sculpins were taken in moderate amounts at the relatively deeper depths.

Northern Lake Michigan: Significant catches of alewife in northern Lake Michigan were made off Sturgeon Bay at 15, 20, and 25 fathoms (450 to 650 pounds) and in Grand Traverse Bay at 25 and 35 fathoms (525 and 450 pounds). The best catches of chubs (230 to 600 pounds) were taken at 20 to 45 fathoms off Arcadia, Michigan. A fairly large catch of white suckers (325 pounds) was taken in Little Traverse Bay. Sculpins and smelt also were caught in moderate amounts in northern Lake Michigan.

Green Bay: Operations in Green Bay produced only small catches of alewife. Individual catches of smelt (250 pounds) and white suckers (120 and 195 pounds) were the only species caught in significant amounts throughout Green Bay.

Echo-sounder recordings near the entrance to Green Bay indicated scattered fish at mid-depths--apparently the vanguard of the migration of alewife into Green Bay.

**HYDROGRAPHIC DATA:** Bathythermograph casts were made in each fishing area, and air and water temperatures were recorded continuously. During the cruise, the surface water temperatures of Lake Michigan ranged from 34° to 48° F. and those of Green Bay from 36° to 58° F.

**M/V "Kaho" Cruise 19** (June 23-July 23, 1964): To extend knowledge of the seasonal distribution, abundance, and availability of alewife and chub stocks to bottom trawls was the primary objective of this cruise by the Bureau's exploratory fishing vessel *Kaho*. The announcement of this cruise was made June 18, 1964. Following trawl explorations in Green Bay and northern Lake Michigan from June 23 to July 2, the vessel berthed at

its base in Saugatuck, Mich., for about ten days and then resumed trawl explorations in southern Lake Michigan.

**Area of Operation:** Lakewide transects were planned in Lake Michigan between Benton Harbor, Mich., and Waukegan, Ill.; Port Washington, Wis., and White Lake Mich.; Manitowoc, Wis., and Ludington, Mich.; and Frankfort, Mich., and Sturgeon Bay, Wis. Previously established fishing stations in Green Bay and northern Lake Michigan near Manistique, north of Beaver Island, and in Little and Grand Traverse Bays.

**Method of Operation:** High-resolution echosounding equipment was to be used to record bottom and off-bottom fish concentrations. A 52-foot (headrope) fish trawl was to be used at standard stations to assess the commercial trawling potential. Thirty-minute tows were to be made at 5-fathom intervals from 10 to 50 fathoms and at 10-fathom intervals from 50 to 70 fathoms along the lakewide transects. Various hydrographic and meteorologic conditions were to be monitored continuously, and night-light stations occupied in southern Lake Michigan to determine the effectiveness of attracting lights.

Note: See Commercial Fisheries Review, June 1964 p. 15.

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#### MORE EFFECTIVE TRAWLING OF COMMERCIAL SPECIES IN LAKE SUPERIOR STUDIED:

**M/V "Kaho" Cruise 18** (May 25-June 10, 1964): To determine the potential for more effective and profitable methods of catching and handling commercial fish species in Lake Superior was the purpose of this cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel *Kaho*. The area of operations was in Lake Superior between Munising and the Keweenaw Peninsula.

This 17-day cruise was the first of three planned for this year. Fishery explorations by the *Kaho* are part of a special program to furnish technical assistance to the fishing industry in the Great Lakes region. Other aspects of the program include studies on the development, preservation, and marketing of fishery products, and economic analyses of existing and potential industry operations.

Principal accomplishments resulting from this cruise included: (1) the location of considerable areas suitable for bottom trawling,

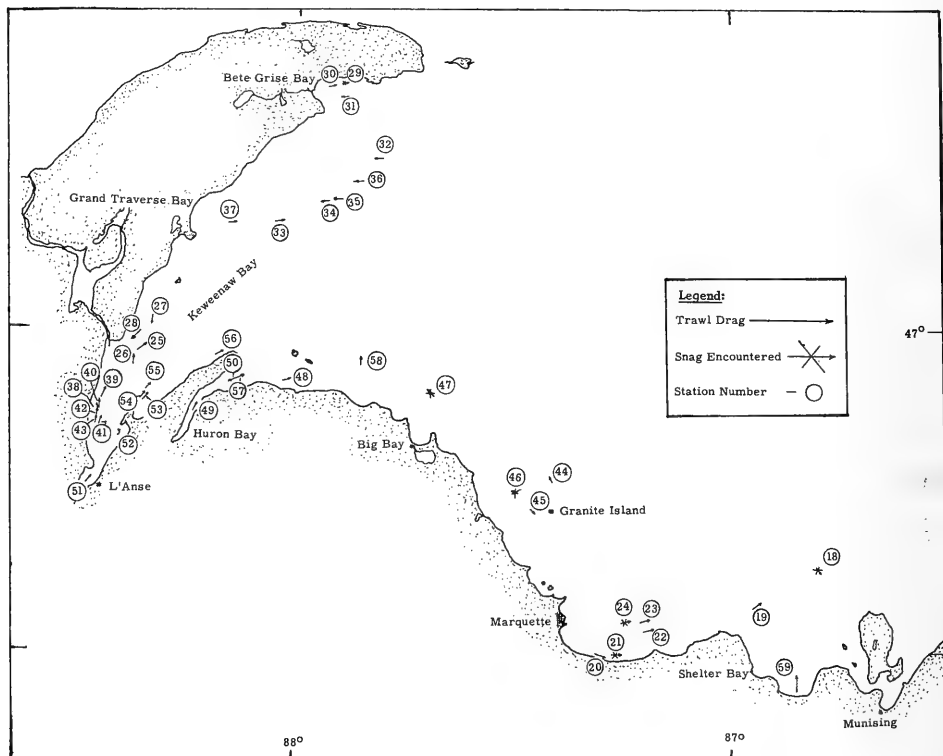


Fig. 1 - Shows area of operation during Kaho Cruise 18, May 25-June 10, 1964.

(2) the catching of commercially significant quantities of chub and smelt, and (3) the incidental detection and recording of midwater concentrations of fish. Although it was necessary to search intensively for good trawling grounds in that area, which is noted for steep and rugged bottom conditions, clear areas were found at various depths ranging from 5 to 62 fathoms. Good catches of chub were taken in Keweenaw Bay and off the eastern shore of Keweenaw Peninsula, and fair amounts of smelt were caught in Keweenaw Bay and Huron Bay. Only small catches of cisco (lake herring) were made during the cruise, but the many small scattered schools of fish detected in middepths could well have been composed of that species. Midwater and surface fishing are to be attempted during the next two cruises scheduled for August and November.

**Exploratory Operations:** Survey transects, totaling about 800 statute miles, were carefully examined with a high-resolution white-line-type echo-sounder and a standard deep-water sounder. The former instrument detects subsurface fish, discriminates fish echos from bottom echos when the two are in close proximity, and provides evidence of bottom characteristics (figure 2).

A total of 42 drags was made with a 52-foot (headrope) Gulf of Mexico-type fish trawl where bottom conditions appeared to be suitable (see table 1). Dragging time was held to 15 minutes during most of the operation because of unfamiliarity with bottom conditions and to permit broader coverage within the limited time period. Snags, logs and trees, or rough bottom conditions were encountered during 13 drags--most of which were terminated when

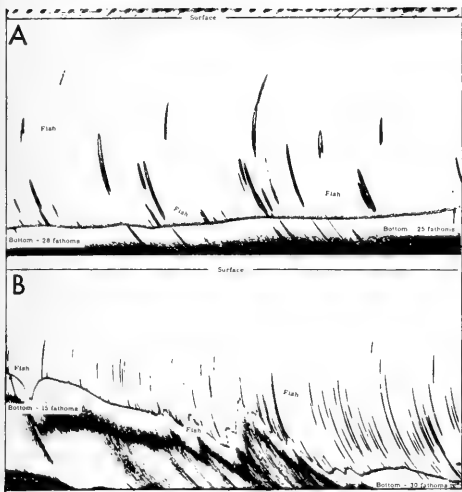


Fig. 2 - Echograms from a high resolution echo-sounder showing bottom profile, fish near the bottom, and at midwater depths. A--Echogram made at station 50; distance traveled is 2 nautical miles. B--Echogram made near station 53; distance traveled is approximately 4 nautical miles.

difficulties were recognized. Only 3 of the encounters resulted in severe net damage. Four others suffered minor damage and the remaining 6 caused no damage.

The actual fishing effort during the cruise was limited due to the time required for searching out trawlable grounds. Activities from Munising to Big Bay were restricted because of numerous commercial gill-netting operations. Although soundings were made to depths of over 100 fathoms, fishing was confined for the most part to depths of less than 50 fathoms (see table 1).

**Fishing Results:** The best fishing results of the cruise were in Huron Bay, Keweenaw Bay, and off the east shore of Keweenaw Peninsula. Chub were caught in amounts of from 110 to 415 pounds in seven 15-minute drags, and smelt in amounts up to 300 and 320 pounds in two 30-minute drags. Smelt were found to be distributed over a relatively wide depth range of from 5 to 39 fathoms. Catches of that species consisted of many sizes ranging from small 3- to 4-inch juveniles to the older fish measuring 12 inches long or over. Relatively large chubs were caught in commercially significant quantities at depths ranging from 35 to 62 fathoms--the deepest water

Dredge No.	Depth in fathoms	Length of Dredge in fathoms	Actual Catch in Pounds							
			Total	Alse-wite	Clab	Seait	White fish	Crab	Lake trout	Other
58	17-45	30	13	1	-	10	1	-	-	1
18	7-10	3/30	2	-	-	-	-	-	1	1
19	18-21	3/32	0	1	-	-	-	-	-	-
20	8	30	50	-	-	1	41	-	-	-
21	8-11	5/30	1	1	-	1	1	-	-	2
22	18-30	30	8	-	-	4	1	-	-	3
23	33-35	2/34	8	-	-	1	1	-	-	1
40	34	30	32	30	-	-	-	-	-	1
24	29-31	4/30	1	-	-	4	-	-	-	3
46	30	3/7	33	1	-	-	-	-	23	1
44	42	5/10	18	1	18	-	-	-	-	2
48	12	5/13	1	-	-	1	-	-	-	-
49	12	15	80	35	-	35	8	1	1	5
47	20	5/5	1	-	-	-	-	-	-	-
57	22-24	30	335	15	2	300	15	-	-	3
58	22-25	15	2	2	-	-	-	-	-	-
90	28	30	350	13	6	320	6	-	-	2
38	5-8	15	7	-	-	1	-	-	-	4
42	6-8	30	100	7	-	55	8	3	20	7
39	7-8	15	110	-	-	90	8	-	11	4
43	7-10	15	10	-	-	2	-	-	7	1
40	10-11	15	4	-	-	2	-	-	-	-
31	10-15	15	8	-	-	2	-	-	-	-
41	14-15	15	28	-	-	47	1	-	-	1
18	15-23	15	3	-	-	-	-	-	1	1
30	50	5/18	4	1	2	10	-	1	15	1
27	21-25	30	30	-	4	25	-	-	-	1
28	28-30	30	80	33	33	45	8	-	-	1
36	32-37	30	135	2	62	45	-	-	3	12
35	35	15	145	-	115	-	-	-	3	8
38	39-39	5/30	15	178	43	31	-	-	-	3
44	41	15	120	-	120	-	-	-	-	2
55	50	3/10	43	-	40	-	-	-	1	1
39	5	U / 4	0	-	-	-	-	-	-	1
30	10	15	80	-	-	1	3	-	-	1
31	13-15	15	60	-	-	85	-	-	-	4
32	38-39	15	178	-	-	1	-	-	-	1
37	38-39	15	448	1	415	-	-	-	8	10
36	34-47	15	330	-	230	-	-	-	8	1
34	48-51	15	170	-	170	-	-	-	-	1
36	54-55	15	175	-	160	-	-	-	-	4
32	57-62	15	180	-	110	-	-	-	1	5/29

\*None present in haul.  
 \*Sample, no haul.  
 \*Unmeasured pit run, dug damaged early.  
 \*Unmeasured small bottom, no damage.  
 \*Large net, no damage.  
 \*Haul up, no damage.  
 \*Haul up, no damage.

**Water Temperatures:** A bathythermograph and continuous surface temperature recorder were used to monitor thermal gradients in the areas fished. Stratification was not well defined, but surface temperatures varied from 40° F. to 52° F. from offshore to sheltered waters and bottom temperatures ranged from 39° F. to 48° F. in the same manner.

**Technological Studies:** Observations were made and fish samples collected to initiate technological preservation and processing investigations in connection with the Lake Superior technical assistance program.



## Great Lakes Fishery Investigations

### SEA LAMPREY CONTROL IN LAKE SUPERIOR AND LAKE MICHIGAN:

The number of spawning-migrant sea lampreys captured at the electric barriers on streams tributary to Lake Superior totaled 8,816 as of June 12, 1964, compared with 6,736 and 6,138 for the same period in 1963 and 1962, respectively. Reports indicated that conditions were favorable for an early sea lamprey run during the 1964 season which may explain the larger number of lampreys captured. The June 1964 catch was still well below that of 1961 when 42,395 adults were taken through the same period. The three barriers on streams entering northern Green Bay of Lake Michigan caught only 4,319 adult sea lampreys through June 12, 1964, compared with 6,995 for the same period in 1963.

Note: See Commercial Fisheries Review, October 1963 p. 23, July 1963 p. 38.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-17 (May 12-26, 1964): Shrimp distribution studies in the northwestern part of the Gulf of Mexico (off the Mississippi to Texas coasts) were continued during this cruise by the chartered research vessel Gus III of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made.

During this cruise, 43 tows with a 45-foot flat trawl were made, as well as 46 plankton tows, 60 bathythermograph and 43 nansen bottle casts. Eight of the shrimp trawl tows were made in depths varying from 200 to 480 fathoms. Shrimp specimens collected in those tows were to be identified later and then added to the Galveston Biological Laboratory's reference collection. One sled-mounted Gulf V plankton tow was made successfully in a depth of 520 fathoms.

The largest catches of brown shrimp were made in area 16 (41 pounds of 15-20 count) from the over 20 fathom depth, and 11 pounds of 21-25 count shrimp from the 10-20 fathoms depth range. Area 20 yielded 33 pounds of brown shrimp (over 68 count) from the up to 10 fathom depth and also 46 pounds of small pink shrimp from that same depth. Catches of pink shrimp in other areas were sporadic (yielding less than one pound each) except in area 19 where 5 pounds was taken from the 0-10 fathom depth.

Catches of white shrimp were moderate in area 13 (30 pounds of mostly 21-25 count) with the 10-20 fathom depth yielding the greater part. White shrimp were also caught in the 0-10 fathom depth of area 19 (20 pounds of 15-20 count), as well as 6 pounds of the same count from 10-20 fathoms in that area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, July 1964 p. 14.



## Industrial Fishery Products

### OBSERVATIONS AND VIEWS IN TEXAS ON USE OF FISHERY BYPRODUCTS IN ANIMAL FEED:

Mixed feed manufacturers and experiment station workers in Texas were visited during April 27-May 5, 1964, by the Animal Nutritionist of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit, Boston, Mass. Observations made during that trip and the views of persons interviewed follow:

Whereas nearly all the feed mill officials and experiment station scientists visited on the trip expressed high regard for fish reduction products in nutrition, many offered comments that, taken together, suggest that the future market for those products may tend to decrease unless some changes are made.

The comment most frequently heard was that at the prices prevailing in April and May 1964, fish meal is in danger of being "priced off the market." For example, a nutritionist employed by a large firm stated that fish meal is not included in his rations, formulated by linear programming, unless minimum levels are specified. Broiler and poultry breeder



rations produced by that firm do contain 3-percent fish meal, but this is only because of the minimum that is specified, whereas turkey starter rations are supplied with more liberal levels as "safety factors." Another nutritionist employed by a large firm said that less than 1 percent of fish meal is incorporated in his rations by computer formulation, but he includes 3 percent of the meal in his turkey and broiler starter rations "just to be on the safe side."

The comment encountered with second greatest frequency is that the mixed feed industry cannot much longer tolerate the extreme variability in quality exhibited by some imported fish meals and, in addition, according to a number of mixed feed producers, domestic fish meals are not invariably of top quality. A leading experiment station scientist pointed out that the amounts of feed mixed by present-day methods according to a single formula are extremely large and, for that reason, mistakes of any kind in feed mixing cannot be tolerated. If ingredients (including fish meal) below the quality specified in the formula are included in the mixture, the end result might be a ration that would not perform properly in actual use. The scientist suggested that if fish meal of uniform high quality cannot be marketed, the second best solution may be to sell three different grades of meal. Several nutritionists employed by feed mills stated that there is little hope that a grading system can be made to function effectively.

An official of a very large Texas firm stated that for the past 6 years his company has been using only imported pilchard meal because of its consistently high quality and also because it is slightly less expensive at the company's mill than is United States whole meal. (Whole meal is preferred to ordinary fish meal by the officials of this particular firm.) During a period of several years, only one shipment of inferior pilchard meal was received and a satisfactory adjustment was made on that shipment without delay.

A nutritionist representing a very large feed-producing firm dramatized the prevailing situation with regard to variability in fish meal quality by exhibiting some samples under magnification. Concerning a sample that contained excessive amounts of salt, scales, and bone, he said: "The sale of this sort of product is going to ruin the market for fish meal unless buyers are informed in advance of the quality of the products they are getting."

A number of nutritionists stated that since the introduction on the market of a uniform high quality poultry byproducts meal, feed producers are no longer dependent entirely upon fish meal. It was also pointed out by a number of nutritionists that the quality of feather meal produced by some firms is quite high and that such meal is competitive with fish meal as a source of some amino acids and B vitamins.

Workers also pointed out that the two commonly used methods of measuring the fat in fish meal yield very different results. The two methods are the ether extract procedure and the method of the A.O.A.C. (Association of Official Agricultural Chemists). This problem should receive early attention; the statement that a given sample of fish meal contains a definite amount of fat should not leave the buyer in doubt as to the actual amount of this nutrient present.

Several producers of cattle feeds expressed interest in fish meal as an ingredient of "range blocks." Such blocks, consisting of a mixture of protein, mineral, and vitamins, often contain fish meal. Cattle feed producers also expressed interest in the possibility of using marine oils in their products when, and if, the prices of such oils should decline low enough to make them competitive with stabilized fats.

A leading Texas research scientist suggested experiments to determine the feasibility of using marine oils in the nutrition of young turkeys. He suggests that the oils might be used at levels as high as 5 percent of the ration to stimulate growth for 8 to 16 weeks, then reduced to 1 percent, or less, to avoid the possibility of off-flavors in the meat. Because of the large number of turkeys grown in the United States, such work offers a possible market that may be large enough to absorb any overproduction of marine oils that may take place in the future. At present prices, fish oil is

too valuable to be used as a source of energy. However, if at some future time the price of the oil should decline enough to make it competitive with stabilized fats, its use in turkey feeding can be given consideration. (Technical Advisory Unit, U. S. Bureau of Commercial Fisheries, Boston, Mass.)

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## U. S. FISH MEAL AND SOLUBLES:

**Production and Imports, January-April 1964:** Based on domestic production and imports, the United States available supply of fish meal for January-April 1964 amounted to 175,429 short tons—26,059 tons (or 17.4 percent) more than during January-April 1963. Domestic production was 3,229 tons (or 1.8 percent) less, but imports were 29,288 tons (or 22.0 percent) higher than in January-April 1963. Peru continued to lead other countries with shipments of 130,276 tons.

The United States supply of fish solubles (including homogenized fish) during January-April 1964 amounted to 7,377 tons—a decrease of 28.0 percent as compared with the same period in 1963. Domestic production and imports dropped 31.8 percent and 8.3 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-April 1964 with Comparisons			
Item	Jan.-Apr.		Total 1963
	1/1964	1963	
..... (Short Tons) .....			
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden .....	3,146	4,991	181,750
Tuna and mackerel .....	5,207	7,167	26,957
Herring .....	2/-	-	7,537
Other .....	4,705	4,129	37,208
Total production .....	13,058	16,287	253,452
<b>Imports:</b>			
Canada .....	19,300	13,603	50,925
Peru .....	130,276	104,219	291,544
Chile .....	7,396	12,220	24,249
Norway .....	-	331	1,819
So. Africa Republic. ....	4,578	1,950	12,296
Other countries .....	821	760	2,274
Total imports .....	162,371	133,083	383,107
Available fish meal supply .....	175,429	149,370	636,559
<b>Fish Solubles:</b>			
Domestic production 2/. ....	5,838	8,562	107,402
<b>Imports:</b>			
Canada .....	737	781	2,034
Iceland .....	-	105	160
So. Africa Republic. ....	604	-	411
Other countries .....	198	792	4,168
Total imports .....	1,539	1,678	6,773
Available fish solubles supply. .	7,377	10,240	114,175
1/ Preliminary.			
2/ Included with "other."			
3/ 50-percent solids. Includes production of homogenized condensed fish.			

1/ Preliminary.

2/ Included with "other."

3/ 50-percent solids. Includes production of homogenized condensed fish.

\*\*\*\*\*

**Production and Imports, January-March 1964:** Based on domestic production and imports, the United States available supply of fish meal for January-March 1964 amounted to 112,205 short tons—2,218 tons (or 1.9 percent) less than during January-March 1963. Domestic production was 2,160 tons (or 27.2

U. S. Supply of Fish Meal and Solubles, January-March 1964 with Comparisons			
Item	Jan.-Mar.		Total 1963
	1/ 1964	1963	
..... (Short Tons) .....			
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	2/	-	181,750
Tuna and mackerel . . . . .	3,445	5,739	26,957
Herring . . . . .	2/	2/	7,537
Other . . . . .	2,342	2,208	37,208
Total production . . . . .	5,787	7,947	253,452
<b>Imports:</b>			
Canada . . . . .	13,329	9,454	50,925
Peru . . . . .	84,392	87,751	291,544
Chile . . . . .	4,379	6,835	24,249
Norway . . . . .	-	331	1,819
So. Africa Republic . . . . .	3,578	1,450	12,296
Other countries . . . . .	740	655	2,274
Total imports . . . . .	106,418	106,476	383,107
Available fish meal supply . . . . .	112,205	114,423	636,559
<b>Fish Solubles:</b>			
Domestic production 2/ . . . . .	2,793	5,361	107,402
<b>Imports:</b>			
Canada . . . . .	455	563	2,034
Iceland . . . . .	-	105	160
So. Africa Republic . . . . .	429	-	411
Other countries . . . . .	198	729	4,168
Total imports . . . . .	1,082	1,460	6,773
Available fish solubles supply . . . . .	3,875	6,821	114,175
1/ Preliminary.			
2/ Included with "other."			
3/ 50-percent solids. Includes production of homogenized condensed fish.			

percent) less, and imports were only 58 tons less than in January-March 1963. Peru continued to lead other countries with shipments of 84,392 tons.

The United States supply of fish solubles (including homogenized fish) during January-March 1964 amounted to 3,875 tons--a decrease of 43.2 percent as compared with the same period in 1963. Domestic production and imports dropped 47.9 percent and 25.9 percent, respectively.

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Production and Imports, January-February 1964: Based on domestic production and imports, the United States available supply of fish meal for January-February 1964 amounted to 70,013 short tons--6,300 tons (or 9.9 percent) more than during January-February 1963. Domestic production was 1,403 tons (or 27.3 percent) less, but imports were 7,703 tons (or 13.1 percent) more than in January-February 1963. Peru continued to lead other countries with shipments of 55,222 tons.

The United States supply of fish solubles (including homogenized fish) during January-

U. S. Supply of Fish Meal and Solubles, January-February 1964 with Comparisons			
Item	Jan.-Feb.		Total 1963
	1/1964	1963	
	(Short Tons) . . . . .		
<b>Fish Meal and Scrap:</b>			
Domestic production:			
Menhaden . . . . .	2/	-	181,750
Tuna and mackerel . . . . .	2,022	3,930	26,957
Herring . . . . .	2/	2/	7,537
Other . . . . .	1,707	1,202	37,208
Total production . . . . .	3,729	5,132	253,452
Imports:			
Canada . . . . .	7,803	5,794	50,925
Peru . . . . .	55,222	46,631	291,544
Chile . . . . .	1,051	3,800	24,249
Norway . . . . .	-	331	1,819
So. Africa Republic . . . . .	1,678	1,450	12,296
Other countries . . . . .	530	575	2,274
Total imports . . . . .	66,284	58,581	383,107
Available fish meal supply . .	70,013	63,713	636,559
<b>Fish Solubles:</b>			
Domestic production 2/ . . .	1,882	2,645	107,402
Imports:			
Canada . . . . .	345	212	2,034
Iceland . . . . .	-	105	160
So. Africa Republic . . . . .	339	-	411
Other countries . . . . .	198	-	4,168
Total imports . . . . .	882	317	6,773
Available fish solubles supply .	2,764	2,962	114,175
1/Preliminary.			
2/Included with "other."			
3/50-percent solids. Includes production of homogenized condensed fish.			

February 1964 amounted to 2,764 tons--a decrease of 6.7 percent as compared with the same period in 1963. Domestic production dropped 28.8 percent and imports increased 178.2 percent.

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#### U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, April 1964: During April 1964, a total of about 3.5 millionpounds of marine-animal oils and 7,094 tons of fish meal and scrap was produced in the United States. Compared with April 1963, this was a decrease of 3.1 million pounds or 47.0 percent in oil, and a decrease of 1,246 tons or 14.9 percent in meal and scrap production.

Menhaden oil, amounting to 2.7 million pounds, accounted for 77.9 percent of the April 1964 oil production. Compared with April 1963, this was a decrease of 3.0 million pounds. Menhaden meal, amounting to 3,146 tons, accounted for 44.3 percent of the April meal production--a decrease of 1,845 tons, compared with the same month last year.

A total of 3,045 tons of fish solubles was produced in April 1964--a decrease of 1,042

U. S. Production of Fish Meal, Oil, and Solubles, April 1964 1/ with Comparisons					
Product	April		Jan.-Apr.		Total 1963
	1/1964	1963	1/1964	1963	
..... (Short Tons) .....					
<b>Fish Meal and Scrap:</b>					
Herring .....	2/	-	2/	-	7,537
Menhaden 3/ .....	3,146	4,991	3,146	4,991	181,750
Sardine, Pacific .....	-	-	1	-	-
Tuna and mackerel .....	1,762	1,428	5,207	7,167	26,957
Unclassified .....	2,186	1,921	4,704	4,129	22,415
Total .....	7,094	8,340	13,058	16,287	238,659
<b>Shellfish, marine-animal meal and scrap .....</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>14,793</b>
<b>Grand total meal and scrap .....</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>253,452</b>
<b>Fish Solubles:</b>					
Menhaden .....	1,265	1,836	1,325	1,836	74,831
Other .....	1,780	2,251	4,513	5,476	25,347
Total .....	3,045	4,087	5,838	7,312	100,178
<b>Homogenized condensed fish .....</b>	<b>-</b>	<b>950</b>	<b>-</b>	<b>1,250</b>	<b>7,224</b>
..... (1,000 Pounds) .....					
<b>Oil, Body:</b>					
Herring .....	-	2/	-	46	5,709
Menhaden 3/ .....	2,703	5,700	2,767	5,700	167,635
Tuna and mackerel .....	336	301	1,112	1,170	5,735
Other (including whale) .....	433	550	1,122	937	6,748
Total oil .....	3,472	6,551	5,001	7,853	185,827

1/ Preliminary data.  
2/ Included in "other" or "unclassified."  
3/ Includes a small quantity of thread herring.  
4/ Not available on a monthly basis.

1/ Preliminary data.  
2/ Included in "other" or "unclassified."  
3/ Includes a small quantity of thread herring.  
4/ Not available on a monthly basis.

tons or 25.5 percent as compared with April 1963.

The quantity of fish meal processed during the first 4 months of 1964 amounted to 13,058 tons--3,229 tons less than the same period of the previous year. Marine-animal oil amounted to 5.0 million pounds--2,852 pounds less than the same period of 1963.

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**Production, March 1964:** During March 1964, a total of 2,235 tons of fish meal and scrap and 584,000 pounds of marine animal oil was produced in the United States. Compared with March 1963 this was a decrease of 480 tons (17.7 percent) in fish meal production but an increase of 132,000 pounds (29.2 percent) in fish oil production.

The quantity of fish solubles manufactured in March 1964 amounted to 911 tons--1,073 tons less than in March 1963.

Production of tuna and mackerel meal amounted to 1,423 tons which accounted for about 63.7 percent of the March production. Oil from tuna and mackerel (199,000 pounds)

U.S. Production of Fish Meal, Oil, and Solubles, March 1964 1/ with Comparisons				
Product	March		Jan.-Mar.	
	1/1964	1963	1/1964	1963
..... (Short Tons) .....				
<b>Fish Meal and Scrap:</b>				
Herring .....	-	-	2/	2/
Menhaden 3/ .....	-	-	-	-
Sardine, Pacific .....	-	-	1	-
Tuna and mackerel .....	1,423	1,809	3,445	5,739
Unclassified .....	812	906	2,341	2,208
<b>Total .....</b>	<b>2,235</b>	<b>2,715</b>	<b>5,787</b>	<b>7,947</b>
<b>Shellfish, marine-animal meal and scrap .....</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>
<b>Grand total meal and scrap .....</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>	<b>4/</b>
<b>Fish Solubles:</b>				
Menhaden .....	-	-	2/3	-
Other .....	911	1,984	2,793	5,061
<b>Total .....</b>	<b>911</b>	<b>1,984</b>	<b>2,793</b>	<b>5,061</b>
<b>Homogenized condensed fish .....</b>	<b>-</b>	<b>250</b>	<b>-</b>	<b>300</b>
..... (1,000 Pounds) .....				
<b>Oil, Body:</b>				
Herring .....	2/	-	2/	-
Menhaden 3/ .....	-	-	-	-
Tuna and mackerel .....	199	334	776	869
Other (including whale) .....	385	118	689	432
<b>Total oil .....</b>	<b>584</b>	<b>452</b>	<b>1,466</b>	<b>1,301</b>

1/ Preliminary data.  
2/ Included with unclassified.  
3/ Includes a small quantity of thread herring.  
4/ Not available on a monthly basis.

comprised 34.1 percent of the March fish oil production.

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**Major Indicators for U.S. Supply, March 1964:** United States production of fish meal in March 1964 was lower by 17.7 percent as compared with March 1963. Production of fish solubles was down by 59.2 percent, but production of fish oil increased 29.2 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, March 1964					
Item and Period	1/1964	1963	1962	1961	1960
..... (Short Tons) .....					
<b>Fish Meal:</b>					
<b>Production:</b>					
March .....	2,235	2,715	4,245	2,751	3,064
January-February .....	2/3,729	5,232	6,557	4,794	6,944
Year 3/ .....	-	253,452	312,259	311,265	290,137
<b>Imports:</b>					
March .....	40,134	47,895	18,528	20,458	18,652
January-February .....	66,284	58,581	44,246	23,875	16,652
Year .....	-	383,107	252,307	217,845	131,551
<b>Fish Solubles 4/:</b>					
<b>Production:</b>					
March .....	911	2,234	2,137	2,564	2,462
January-February .....	2/1,882	1,662	3,534	3,270	3,509
Year .....	-	107,402	124,334	112,241	98,929
<b>Imports:</b>					
March .....	200	1,143	308	135	87
January-February .....	882	317	2,522	374	2,089
Year .....	-	6,773	6,308	6,739	3,174

(Table continued on next page)

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, March 1964 (Contd.)					
Item and Period	1/1964	1963	1962	1961	1960
	..... (1,000 Lbs.) .....				
<b>Fish Oils:</b>					
<b>Production:</b>					
March	584	452	440	493	592
January-February	2/945	849	1,177	829	1,101
Year	-	185,827	250,075	258,118	209,143
<b>Exports:</b>					
March	222	44,384	19,167	5,644	3,157
January-February	23,698	2,537	22,156	30,905	25,896
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.

2/Preliminary data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/Includes homogenized fish.

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Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, February 1964					
Item and Period	1/1964	1/1963	1962	1961	1960
	..... (Short Tons) .....				
<b>Fish Meal:</b>					
<b>Production:</b>					
January	2,487	2,285	2,941	2,723	3,828
February	1,242	2,847	3,616	2,071	3,116
Jan.-Dec.	-	229,646	298,413	291,337	270,343
Year	-	241,646	311,232	311,265	290,137
<b>Imports:</b>					
January	-	18,495	25,427	9,531	8,571
February	-	40,086	18,819	14,344	8,081
Year	-	383,107	252,307	217,845	131,561
<b>Fish Solubles:</b>					
<b>Production:</b>					
January	1,240	1,441	1,808	1,620	1,697
February	642	1,223	1,726	1,650	1,812
Year	-	96,224	124,334	112,241	98,929
<b>Imports:</b>					
January	-	148	273	219	214
February	-	169	2,249	155	1,875
Year	-	6,773	6,308	6,739	3,174
<b>Fish Oils:</b>					
<b>Production:</b>					
January	396	424	763	489	534
February	549	324	408	366	554
Year	-	184,009	255,808	266,668	215,653
<b>Exports:</b>					
January	-	79	509	13,449	2,068
February	-	2,458	21,647	17,456	23,828
Year	-	262,342	123,050	122,486	143,659

1/Preliminary data for 1963 and 1964 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oils, 95 percent.

2/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

3/Includes homogenized fish.

## Inventions

### MECHANICAL FISHING VESSEL UNLOADER BEING DEVELOPED:

A new mechanical unloader for unloading fish from fishing vessels has been designed by a member of the New Bedford Institute of Technology, and it is being built by a firm in New Bedford, Mass.

The device is lowered into the fish hold where the fish are scooped up into buckets fastened to an endless chain conveyor. The bucket conveyor lifts the fish to deck level where they are deposited onto a belt conveyor and carried up to the wharf. The new type fish unloader was expected to be ready for trial by the end of May 1964.



## Investment Opportunities

### PHILIPPINE FISHING INDUSTRY:

A sizable unsatisfied domestic market for fish, coupled with an export potential, suggests the possibility of investment opportunities in the Philippines for United States fishing interests. One such opportunity, among others, is the joint venture to exploit the fishing resources of Philippine coastal waters proposed by a Manila group. That group, which has wide-spread interests, has already rigged a tugboat for purse-seining and is negotiating for the acquisition of tidal flats for fish and shrimp culture.

Although a Commission of Fisheries was established in 1963 to promote a program designed to make the Philippines self-sufficient in fish production, the Philippine fishing industry has long been handicapped by antiquated methods, inadequate facilities, and lack of investment capital. Philippine imports of fish, largely canned sardines from South Africa, are running at the rate of around 38,000 metric tons a year. Because of the unsatisfied domestic demand, Philippine exports of fish have been negligible.

United States firms, desiring to obtain additional information about the potential of the fishing industry in the Philippines and about specific investment opportunities there, are invited to write to the Bureau of International Commerce, Office of International Invest-



ment, File 4-0910-4H, Department of Commerce, Washington, D. C. 20230. (International Commerce, June 1, 1964.)

\* \* \* \* \*

#### AID ABSTRACTS AVAILABLE AT DEPARTMENT OF COMMERCE FIELD OFFICES:

More than 1,200 studies of investment opportunities have been collected, abstracted, and organized into a card system by the U.S. Agency for International Development (AID). Copies of the new catalog of investment opportunities have been placed in U.S. Department of Commerce field offices in 40 cities.

Now a potential investor can simply go to the nearest Commerce Department field office and run through Keystart cards to pick out the type and location of the investment he has in mind, and then read the abstracts. Should he desire to read one of the reports in its entirety, he can obtain a copy at cost through the field office or from the Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20230.

Where the original study contains sufficiently detailed information, each abstract card contains specific information on the market, total capital required, projected annual sales, production, finance, profitability, manpower, location, and other relevant data. In other cases, the abstract card contains only a general description and summary.

Indexes of the investment studies breaking them down by industry and country are available free of charge at the Commerce field offices or by writing to AID's Office of Development Finance and Private Enterprise, Agency for International Development, Washington, D.C., 20523.

Some of the studies were made with AID help and some were sponsored by international banks, foreign governments, foundations, universities, and private firms.

In making the catalog of investment opportunities widely available, AID is not vouching for the opportunities it contains, but presenting information to investors who wish to know what studies have already been done in their fields of interest.

Studies of investments involving food and kindred products account for more than those on any other single subject. There are 188 such reports. In second place are the 120 studies on business opportunities for producing chemicals and allied products.

There are more surveys (86) dealing with the Philippines than any other nation. In second place is Taiwan with 77, followed by Nigeria with 66, Pakistan with 50, and India with 46.

The AID Office of Development Finance and Private Enterprise has arranged to keep the system up to date. AID Missions throughout the world will engage in a continuous process of seeking new studies of investment possibilities and will report them regularly, so they can be added to the existing card system. Those becoming obsolete will be removed. (International Commerce, May 25, 1964.)



## Irradiation Preservation

### IRRADIATION OF FISH AT SEA:

For the preservation of fish at sea, arrangements were completed in May 1964 to

install a pilot-model cobalt-60 irradiator aboard the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The object of the irradiation experiments at sea is to show that it will result in two important advances: (1) that the quality of fish landed will be significantly higher than that of nonirradiated fish, and (2) that fishing vessels can extend their stay at sea when additional time is needed to make up a full load.

The experiments are part of the research on the irradiation of fishery products conducted by the Bureau's Technological Laboratory at Gloucester, Mass., the home port of the Delaware. Five of the research vessel's trips in 1965 are tentatively scheduled to include laboratory personnel associated with the irradiation programs.

Note: See Commercial Fisheries Review, January 1964 p. 19; February 1963 p. 43.



## Maryland

### CHESAPEAKE BAY "FISH-KILL" CONTROLS ESTABLISHED:

The Maryland State Natural Resource Board has established procedures for dealing with fish losses in Chesapeake Bay. The Board has arranged: (1) close coordination between State agencies when fish kills occur, (2) a weekly survey of Maryland waters to note any kills, and (3) a research program on the causes of catastrophic fish mortalities.

It has been requested that all heavy fish kills in the Chesapeake area be reported to the Maryland State Department of Chesapeake Bay Affairs. That department coordinates all reports and calls in other agencies and groups when their assistance is needed.

Water conditions are being checked weekly in areas where heavy losses have been seen in past years. The plane of the Department of Chesapeake Bay Affairs began weekly flights June 1, 1964, over the Potomac, Patuxent, Patapsco, Middle, Back, and Choptank Rivers, Tangier Sound, Eastern Bay, and the Maryland portion of the open Chesapeake Bay. In addition, the Maryland State Department of Water Resources research vessel Monitor is taking weekly samples of water at 15 locations between Rock Hall and Herring Bay, an area where fish have died during many summers. Special additional trips are scheduled

when needed. The Monitor is being equipped for automatic data recording and simultaneous sampling of temperature, salinity, oxygen, acidity, and turbidity.

Research on suspected causes of fish kills is scheduled to begin in the summer of 1964 at the University of Maryland's biological laboratories at Solomons Island and College Park.

The research will include a study of the bacteria which killed tremendous numbers of white perch and some other species in 1963, and an investigation of changes in temperature, oxygen, and other environmental conditions which may have caused many of the past fish kills.

It is believed that the heavy fish losses in 1963 will not be repeated in 1964, since the more susceptible fish were killed, and the conditions favoring fish destruction are unlikely to occur in the same patterns in a succeeding year. White perch are widespread and in fairly good supply this year, despite the heavy losses in 1963. There is no indication of any danger to swimmers or other people using Chesapeake Bay waters.



## Mississippi

### MISSISSIPPI SOUND POSTLARVAL SHRIMP STUDIES CONTINUED:

The study of postlarval shrimp in Mississippi Sound by the Mississippi State Gulf Coast Research Laboratory continued during March-May 1964. Young brown shrimp appeared early in the year and were more abundant than in 1963. After the peak was reached in April, the number of postlarval shrimp dropped sharply and remained below the 1963 levels since the first of May. Early growth was slow but increased after the water warmed, and it appeared likely that opening of the season would be delayed. Young white shrimp were about a week later this year and numbers were a little higher. (Gulf Coast Research Laboratory, June 2, 1964.)

Note: See Commercial Fisheries Review, May 1964 p. 25.

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### STATE GULF COAST RESEARCH LABORATORY RECEIVES GRANTS:

A grant of \$85,700 to the Mississippi State Gulf Coast Research Laboratory by the Na-

tional Science Foundation was announced April 25, 1964. The money is to be used for the purchase of equipment for the Laboratory's oceanography building which was then under construction.

In May, the National Science Foundation awarded another grant of \$11,100 to the Laboratory for Summer Research. That money will go as payments to students who will be selected by a board after they have attended classes at the laboratory. (Gulf Coast Research Laboratory, June 2, 1964.)



## North Atlantic Fisheries Investigations

### SEA SCALLOP POPULATION

#### SURVEY ON GEORGES BANK CONTINUED:

M/V "Albatross IV" Cruise 64-7 (May 13-22, 1964): To collect quantitative samples of the sea scallop population on the eastern part of Georges Bank was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

Operations included 180 tows (of 10 minute duration) with a 10-foot scallop dredge equipped with an odometer, and 10 drags with a 10-foot beam trawl. An underwater camera was attached to the beam trawl during one transect. In another instance, the underwater camera was lowered into a sonar target area. In addition, 200 bathythermograph casts were made.

Note: See Commercial Fisheries Review, August 1963 p. 41.

\*\*\*\*\*

### BLACKBACK FLOUNDER TAGGING PROGRAM:

The Massachusetts State Division of Marine Fisheries and the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., have completed the first phase of a cooperative tagging program. Using Bureau tags, Massachusetts State biologists tagged 7,000 blackback flounders while working aboard chartered other trawlers in Massachusetts coastal waters north and south of Cape Cod. Bureau biologists aboard the Albatross IV tagged 2,400 fish on Nantucket Shoals and Georges Bank. Through May 1964, about 500 tagged fish had been recovered. Of those, 460 had originally been released in in-shore waters and 40 had been released off-

shore. All recaptured fish were taken in the area of tagging.

\*\*\*\*\*

### RETURN OF UNMARKED OCEANIC INSTRUMENTS REQUESTED:

The rate of return of instruments thrown overboard to rest on the bottom without either a surface or subsurface marker buoy is being

## \$25 REWARD

WILL BE PAID FOR THE RECOVERY  
OF THESE INSTRUMENT CASES.



IF FOUND IN YOUR NETS, BRING  
THEM TO ANY REPRESENTATIVE OF THE

U. S. DEPARTMENT OF THE INTERIOR  
BUREAU OF COMMERCIAL FISHERIES

OFFICES LOCATED IN THESE CITIES & TOWNS.

PROVINCETOWN, MASS.  
WOODS HOLE, MASS.  
NEW BEDFORD, MASS.  
BOSTON, MASS.  
GLOUCESTER, MASS.  
ROCKLAND, ME.  
NEW YORK, N.Y.  
PORTLAND, ME.

tested by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass. Ten dummy units were put out on Georges Bank in May 1964. Signs offering a \$25 reward for their return have been posted at the Boston Fish Pier and the New Bedford auction room. Handbills offering the reward have been distributed at other ports in New England and eastern Canada. If the experiment is a success and most of the dummy units are returned, scientists plan to put thermographs in pressure cases and set up a program to monitor bottom water temperatures continuously on various parts of Georges Bank.



### Oceanography

#### WATER SAMPLING STUDIES IN CENTRAL PACIFIC OCEAN:

A second air flight around the island of Oahu in the Central Pacific Ocean was made on April 11, 1964, by staff members of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, when some 50 packages of drift cards were released. A total of 8 returned drift cards by the end of April, from this second flight and a previous flight, showed that the water being sampled at Koko Head during April had its origin to the south or southwest of Oahu.

\*\*\*\*\*

#### RESEARCH VESSELS OF UNIVERSITY OF MIAMI NOT SUBJECT TO UNION RULES:

The Institute of Marine Science, University of Miami, is not subject to the National Labor Relations Act in the employment of seamen on its oceanographic research vessels, announced the Institute's Director this past May. That decision was handed down by the National Labor Relations Board (NLRB), Washington, D. C., and affirmed a ruling made earlier at a Miami hearing.

The case arose after the Seafarers International Union filed a petition with the NLRB, alleging that the union represented a majority of the unlicensed seamen aboard the Institute's research vessel *Pillsbury*. The union asked that an election be ordered among the oceanographic vessel's crew to determine whether or not they should be unionized.

The NLRB decision--that the Institute and all its research vessels are not subject to NLRB jurisdiction (and are therefore, in effect, exempt from unionization attempts by the Seafarers Union)--is based on the fact that the University of Miami is a nonprofit educational institution.

In its decision, NLRB stated: "The University of Miami, Institute of Marine Science, although performing research for, and substantially supported by, the Federal Government, is first and foremost an educational institution for the advanced study of oceanography. Its research activities contribute directly to its curriculum and program for the practical training of scientists in this field. Hence, this research program is an integral

aspect of the Institute's overall educational function. We conclude, therefore, that the activities of the Institute, including its research program, are primarily educational rather than commercial in character, and we decline to assert jurisdiction herein. Accordingly, we shall dismiss the petition."

The Institute Director stated that the Institute's research expenditures amounted to more than \$2.7 million in 1963--almost one-third of the total spent on research by the entire University of Miami. The Institute of Marine Science has two large seagoing research vessels, the Pillsbury and the Gerda, plus numerous smaller craft. The 176-foot Pillsbury, newest of the fleet, has already logged more than 25,000 miles at sea and has been making a study of the Gulf of Guinea, along the coast of West Africa. The 75-foot Gerda, a converted North Sea trawler, has been doing research in the Gulf Stream and on the Bahama Banks. (Institute of Marine Science, University of Miami, May 13, 1964.)

\* \* \* \* \*

#### DEEP-DIVING SUBMARINE FOR OCEANOGRAPHIC RESEARCH COMMISSIONED BY WOODS HOLE OCEANOGRAPHIC INSTITUTION:

The Alvin, a 22-foot oceanographic research submarine designed to dive 6,000 feet into the ocean, was commissioned June 5, 1964, by the Woods Hole (Mass.) Oceanographic Institution.

A thorough check of all of the installed systems will be made both before and during initial sea trials, and an extensive operator training period in shallow water is planned prior to testing the craft to the design depth of 6,000 feet in the summer of 1964.

Note: See Commercial Fisheries Review, April 1964 p. 25.

\* \* \* \* \*

#### GRANTS AWARDED UNIVERSITY OF MIAMI FOR SEA FLOOR STUDIES:

Two new grants totaling \$348,000 to be used for studies of the ocean floor were received by the Institute of Marine Science, University of Miami, Miami, Fla., announced the Institute Director this past May. The grants, which involve geological investigations of the bottom sediments and the topography of the sea floor, were awarded by the National Science Foundation.

The Institute's scientists will operate from the Institute's 176-foot oceanographic research

vessel, the Pillsbury. Active work on the new projects will begin as soon as the vessel completes its assignment off the coast of West Africa, where Institute scientists were making studies of the Gulf of Guinea.

Most of the work on the sea floor projects will be done in the Caribbean Sea as previous studies indicate that this is one of the best places to obtain undisturbed bottom sediments extending back a million years or more. Such sediments consist mainly of Globigerina-ooze, composed of the shells of microscopic planktonic organisms which live in surface layers of the sea. After the organisms die, their shells sink to the bottom. Analysis of the sediments reveals the changing climatic conditions during the Pleistocene epoch. Through oxygen isotopic studies made at the Institute of Marine Science, investigators have succeeded in tracing the changes in temperature of surface waters back some 375,000 years. The new study, it is hoped, will extend the record back even farther in geologic time and reveal the pattern of changing conditions throughout the Pleistocene.

The topographic studies of the ocean floor will be concerned primarily with an effect to learn more about the origin, composition, and shape of the abyssal hills--unique hills averaging about 1,200 feet in height which cover half the entire ocean floor. Some geologists believe the abyssal hills may be composed of basalt from the earth's lower crust.

The University of Miami team will investigate in detail some typical abyssal hill fields between Bermuda and Puerto Rico. The distribution of hills within selected areas will be studied, and the shapes of particular hills investigated in detail with a view to mapping their topography. Samples of the hills and the surrounding areas will be taken by coring. (Institute of Marine Science, University of Miami, May 6, 1964.)



#### Oregon

##### STEELHEAD PLANTED IN YAMHILL RIVER:

A total of 256 adult spawning winter steelhead trout were transplanted to the Yamhill River system in May 1964 from the Oregon Fish Commission's Dexter holding pond on the Middle Willamette River. Transplanting



the adult spawners to the Yamhill and letting nature rear the young of the transplanted fish to downstream migrant size will help build up the winter steelhead population of the system.

Until recently, poor seasonal passage conditions at Willamette Falls as well as Lafayette Dam on the lower Yamhill had blocked the fish production potential of the river. In late 1963, a Yamhill County crew, with the assistance of Oregon Fish Commission engineers, breached the obsolete Lafayette Dam in an effort to provide access to the upriver spawning areas.

Experimental releases of both steelhead and silver salmon fingerlings in the Yamhill by the Fish Commission during the past several years have demonstrated the suitability of the system for rearing the fish to downstream migrant size. The Oregon Game Commission early in 1964 liberated some 130 adult steelhead in the Yamhill system from the surplus returning to its Alsea hatchery. The additional steelhead transplant from the Middle Willamette, coupled with progress in planning and negotiations for new upstream passage facilities over Willamette Falls at Oregon City, has brightened the future outlook for the development of a worthwhile steelhead run on this readily accessible lower Willamette tributary. (Oregon Fish Commission, May 20, 1964.)



## Salmon

### COLUMBIA RIVER SUMMER FISHERY POSTPONED:

The Columbia River summer commercial salmon season did not open June 16, 1964, as previously scheduled. The decision to delay the opening was the result of joint action taken by the Washington State Department of Fisheries and the Oregon State Fish Commission at a public hearing in Portland, Ore., on June 10. The late spring runoff brought the Columbia River to near flood stage, effectively stopping the migration of chinook salmon. A fishery on those stationary fish in muddy water would take more salmon than should be harvested from the run.

When a migration rate of 1,500 chinook salmon a day over Bonneville Dam showed that the salmon are on the move once again, an opening day for the commercial fishery

was to be set. (Washington State Department of Fisheries, June 12, 1964.)



## Shellfish

### ANESTHETIC MAY AID BIOLOGICAL RESEARCH:

A proposed shellfish anesthetic has been investigated by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn. The experiments involved propylene phenoxetol, a colorless, oily, nontoxic liquid that has been reported effective as an anesthetic for shellfish. A drug which would permit experimental manipulation of completely relaxed but living mollusks would be of great value for anatomical and physiological investigations.

Actively pumping hard clams (*M. mercenaria*) were exposed to varying concentrations of propylene phenoxetol in sea water. At drug levels of 0.5 to 1 percent, about 20 percent of the treated clams gaped, because completely relaxed, and could be freely handled. Shortly after being returned to normal sea water, they showed complete recovery.

In another experiment, clams, oysters, and mussels were anesthetized by hypodermic injection into the mantle cavity, but high mortality followed the direct injection treatment.



## Shrimp

### UNITED STATES SHRIMP SUPPLY INDICATORS, MAY 1964:

Item and Period	1964	1963	1962	1961	1960
	..... (1,000 Lbs. Heads-Off) .....				
<b>Total landings, So. Atl. and Gulf States:</b>					
July.....	-	19,767	12,294	10,500	21,746
June.....	-	13,161	11,309	8,233	12,427
May.....	8,400	10,152	6,186	5,276	6,335
April.....	5,016	4,427	3,358	3,171	4,728
January-March..	14,678	11,611	11,294	14,350	13,285
January-December	-	138,281	105,839	91,396	141,035
<b>Quantity canned, Gulf States 1/:</b>					
July.....	-	3,726	3,551	2,793	5,802
June.....	-	5,234	4,913	3,438	6,920
May.....	900	3,831	1,794	1,208	1,461
April.....	-	105	12	9	66
January-March..	684	842	819	308	587
January-December	-	29,468	23,322	14,500	26,394
<b>Frozen inventories (as of end of each mo.) 2/:</b>					
July 31.....	-	25,460	13,677	14,849	17,397
June 30.....	-	24,047	13,796	19,416	15,338

(Table continued on next page)

Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off) .....					
<b>Frozen inventories (as of end of each mo.) 2/:</b>					
May 31 .....		24,053	13,904	24,696	17,540
April 30 .....	28,950	24,954	15,637	27,482	20,502
March 31 .....	31,428	27,970	16,607	31,345	23,232
February 29 .....	35,303	28,039	19,012	37,612	29,063
January 31 .....	43,752	28,487	21,328	37,842	34,332
<b>Imports 3/:</b>					
July .....	-	11,002	8,265	6,635	7,319
June .....	-	9,439	9,397	8,065	8,832
May .....	-	11,110	11,020	8,278	9,802
April .....	12,886	11,082	10,210	9,208	7,733
January-March .....	37,739	38,855	33,169	31,617	24,798
January-December .....		151,530	141,103	126,268	113,418
... (c/lb., 26-30 Count, Heads-Off) ...					
<b>Ex-vessel price, all species, So. Atl. and Gulf Ports:</b>					
July .....	-	63.5	82.1	55.8	54.6
June .....	-	77.0	84.4	53.7	64.1
May .....	4/59-62	80.9	83.7	52.8	62.9
April .....	4/57-61	83.6	82.2	55.4	60.6
March .....	4/57-61	85.5	80.9	56.0	56.3
February .....	4/57-62	85.7	78.9	53.5	51.8
January .....	4/57-69	85.0	76.3	52.5	49.5
<b>Wholesale price, froz. brown (5-lb. pkg.), Chicago, Ill.:</b>					
July .....	-	77-87	-	70-75	72-77
June .....	-	95-102	102-104	67-72	76-77
May .....	72-78	100-103	96-103	67-69	74-77
April .....	71-74	100-105	94-97	69-70	74-75
March .....	72-75	102-106	94-95	69-71	65-68
February .....	73-82	102-106	93-95	69-71	65-67
January .....	78-83	102-106	91-94	69-71	64-66
1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.					
2/Raw heads only; excludes breaded, peeled and deveined, etc.					
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.					
4/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.					
Note: May 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to head-on weight multiply by 1.68.					



## South Atlantic and Gulf of Mexico

### SOVIET FISHING ACTIVITY:

Fifteen Soviet vessels fishing off North Carolina and Virginia with large mid-water trawls were spotted during March and April 1964. Soviet fishing vessels were seen periodically in the Gulf of Mexico. In June some of them were seen 20 miles off Tarpon Springs, Fla. It was reported that Soviet activities in the Gulf appeared to be of an exploratory nature--with evidence of increasing effort. It was believed some of those vessels were based in Cuba.



## South Atlantic Exploratory Fishery Program

### BOTTOMFISH EXPLORATIONS CONTINUED:

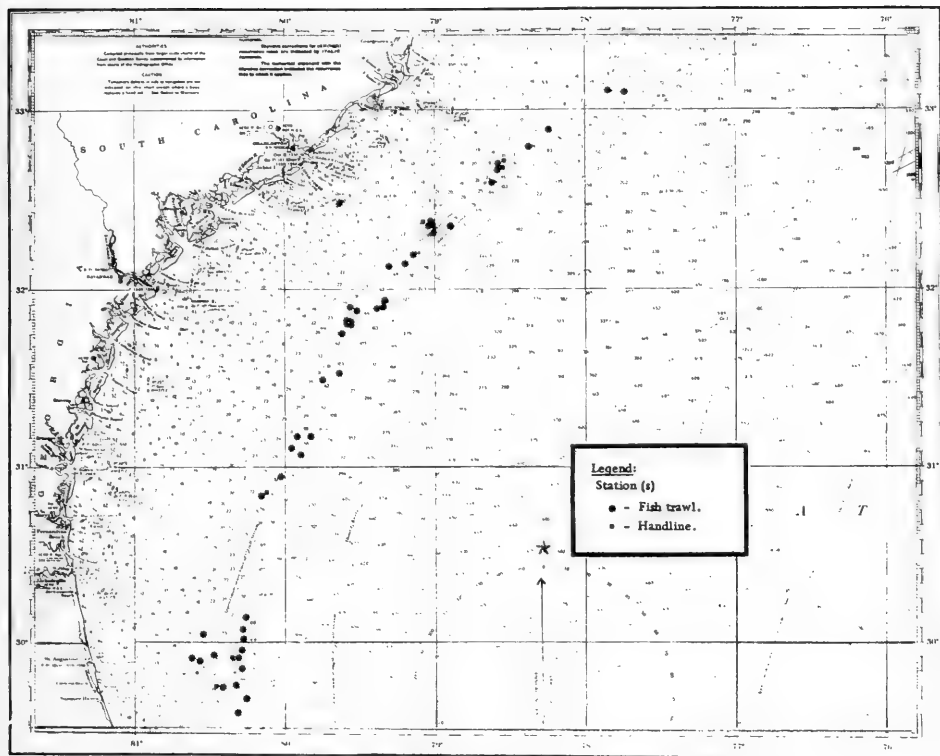
M/V "Silver Bay" Cruise 57 (April 30-May 19, 1964): To continue bottomfish explorations off South Carolina, Georgia, and northern Florida was the primary objective of this 20-day cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. A total of 68 exploratory fishing stations were occupied on the outer Continental Shelf. Exploratory gear consisted primarily of 50/70-foot, 4½-inch mesh and 70/90-foot, 2½-inch mesh roller-rigged fish trawls. The nets were fished on 8-foot bracket doors with 15-foot leglines. Cod-ends were 1½-inch mesh.

Trawling and sonic fish detection transects confirmed previous observations that the filefish (*Stephanolepis hispidus*) is presently the dominant fish, both numerically and by weight, in the 13- to 25-fathom depth range off much of the southeastern coast. Trawling in those depths east of St. Augustine, Fla., produced only small amounts of vermilion snapper (*Rhomboplites aurorubens*), red snapper (*Lutjanus aya*), and groupers mixed with 1,000- to 4,000-pound catches of filefish.

Limited trawling was done east of the Savannah (Ga.) light vessel to assess the seasonal availability of two fish populations located during previous Silver Bay cruises. In that area, pink porgies (*Pagrus sedecim*) and butterfish (*Poronotus triacanthus*) were still present in large numbers in trawl samples at 35-40 fathoms and 75-85 fathoms.

Snapper and grouper were taken throughout the survey area. Trawling in 24 fathoms in one area off South Carolina (32°40' N., 78°34' W.), produced small amounts of pink porgy, red snapper, red grouper (*Epinephalus morio*), scamp (*Mycteroperca phenas*), and gag (*M. microlepis*). Hand Lines fished for 3 hours in 31-34 fathoms at another South Carolina location (32°21' N., 79°02' W.), produced a 1,425-pound catch consisting of grouper, large red snapper, and amberjack.

Extensive midwater and near-bottom fish schools were recorded in 70 fathoms off St. Helena Sound, S.C. Catch results indicated that most of those schools consisted of round herring (*Etrumeus sadina*).



Areas investigated during M/V Silver Bay Cruise 57 (April 30-May 19, 1964).

Note: See Commercial Fisheries Review, March 1964 p. 25.



## Tagging

### PATENTS AWARDED ON NEW METHODS FOR TRACKING FISH MIGRATIONS:

The patent rights on a newly developed device that may prove effective in more accurately following the migrations of salmon and other fish were recently received by the U.S. Department of the Interior.

Tagging programs are considered an essential part of scientific studies done on fish migrations. Recently, a patent on a new method of tagging young fish and later recovering them was awarded to two employees

of the Washington State Department of Fisheries.

A specially developed instrument, on which another patent is pending, inserts a tiny steel wire in the head of the fish. The wire is coded with strips of color or magnetic bits of information, which the fish carries as it moves about. Electronic equipment installed in fish-processing establishments separates the tagged fish from untagged fish and the wires are then extracted for scientific study. The process was originally developed to evaluate Columbia River salmon resources. (Science News Letter, May 2, 1964.)



## Trout

### U. S. PRODUCTION BY COMMERCIAL FARMS:

Commercial trout farms throughout the United States are estimated to produce about 5½ million pounds of trout each year. Converted to number of fish, this would be about 25 million trout. The gross income from the sale of those trout is more than \$5 million a year.

This information is contained in a report titled "The Commercial Trout Farming in the U.S.A.," published in the July-August 1961 issue of the U. S. Trout News. A portion of that report stated:

"Trout production was probably not less than 5,333,000 pounds (3,125,000 pounds reported and 2,188,000 pounds estimated) or 24,987,000 fish (12,481,000 reported in 1959, 3,750,000 additional based on the 1954 survey, and 8,756,000 additional estimated by the Association)."

"By comparison in 1958 the Federal Government and the various states involved distributed a combined total of 12,771,770 pounds of trout (175,602,250 fish). Thus, trout production by all means, private and public, in the United States must be in the neighborhood of at least 18 to 20 million pounds annually. Rainbow trout account for approximately ¾ of this total." (U. S. Trout News, March-April 1964.)



## Tuna

### 1964 ALBACORE AND BLUEFIN TUNA CATCH FORECAST FOR UNITED STATES PACIFIC COASTAL AREA:

Following is a report by the staff on the Tuna Forecasting Program of the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, concerning the expected catch during 1964 in the temperate tuna fishery of the eastern Pacific Ocean:

Albacore: During 1963 additional research indicated a relationship between oceanic conditions and the onset of the albacore fishery. Normally, in the temperate eastern Pacific, the ocean changes from winter cooling to spring heating in early March. In years when the change occurs early, the albacore fishery

Early-Season Albacore Landings for California (June) and Oregon-Washington (July)		
Year	Landings	
	Calif. (June)	Oreg.-Wash. (July)
	..... (Pounds) .....	
1963	2/0	1/
1962	28,414	1/
1961	35,603	1/
1960	126,353	23,007
1959	50,976	1,881,881
1958	14,228	415,892
1957	511,799	94,468
1956	210,527	0
1955	16,002	0
1954	2,866	0
1953	97,258	0
1952	6,299	14,509
1951	157,917	95,145
1950	1,143,139	3,819,132
1949	82,747	1,401,712
1948	85	4,505,801
1947	415,849	2,303,505
1946	424,082	1/
1945	6,175	1/
Average	175,282	3/1,039,646

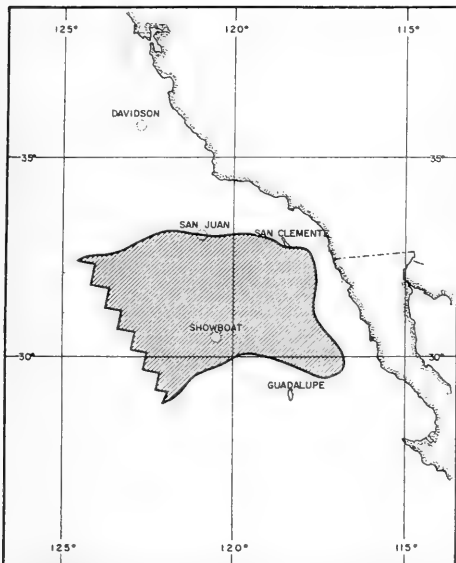
1/ Data not available.

2/ Preliminary.

3/ Computed on basis of 1947-1960 landings.

usually begins early; conversely, when heating is late, the onset of the fishery is delayed. This year initial heating was later than usual, and consequently, it was forecast that June 1964 landings of albacore in California would be below average. California albacore landings in June for the period 1945-1963 have averaged 175,282 pounds and ranged from over one million pounds in 1950 to zero in 1963 (see table). In addition, because ocean waters off Oregon and Washington in 1964 were colder than average, and the change from cooling to heating was also late in that area, it was estimated that July 1964 albacore landings in those States would also be below average (see table).

The forecast called for the best albacore fishing in July 1964 off southern California to be located in approximately a rectangle area extending roughly from 30° N. latitude to a line running west through San Clemente and San Juan Islands. The western boundary of that area should be in the vicinity of 124° W. longitude (see chart on following page). The area begins some 30 to 50 miles offshore and encompasses the offshore waters between San Clemente Island and just north of Guadalupe Island. It was indicated that good fishing for albacore could extend to Guadalupe. That area was plotted from April 1964 temperature and salinity data taken at a depth of 10 meters. As a result of an unusually intense upwelling affecting temperature and salinity



Cross-hatched region delineates the area expected to produce about two-thirds of the total July 1964 albacore catch off southern California (United States) and Baja California (Mexico).

data along the southern California coast, the predicted area of good albacore fishing may not represent sufficiently the southern limit of the fishery.

The estimate of the 1964 albacore catch is restricted, as in previous years, to the amount that will be taken south of the International Border between the United States and Mexico. The basis of that prediction is the apparent relationship between water temperature at selected shore stations during the winter months and the catch the following summer of albacore off Baja California and bluefin off southern California. In "cold" years both species generally occur farther south and in "warm" years, farther north. It is expected that about 9.8 million pounds of albacore will be caught in 1964 from waters south of the United States-Mexican Border, which is below the 1945-1962 average albacore catch of 14.2 million pounds. In 1963, it was estimated that the landings from south of the International Border would be slightly less than average. Preliminary data indicate that about 7 million pounds were taken.

**Bluefin:** Fishing effort devoted to bluefin tuna has increased markedly in the years since the conversion of the tropical bait-boat fleet to purse-seining. Conduct of the fishery has apparently changed also in less obvious ways, for there has been little success in forecasting the catch from waters north of the United States-Mexican Border. The relationship mentioned above (whereby the bluefin catch north of the International Border was found to be related to winter water temperature) will have to be modified to account for the recent changes in fleet composition.

In 1962, on the basis of historical data, it was forecast that 5.7 million pounds of bluefin would be landed from waters north of the International Border. Entry of converted purse seiners increased fishing effort more than 3 times the average for the preceding 10 years and the catch of 17.0 million pounds in 1962 was about 3 times that predicted. In 1963, it was estimated that 7.7 million pounds of bluefin tuna would be caught from the northern region with effort comparable to preconversion years, but that effort equalling 1962 might result in a catch of 15-20 million pounds. Effort, although not yet tabulated, was about the same as in 1962. Preliminary statistics indicate, however, that the fleet still caught only about 7 million pounds north of the International Border.

Based upon the catch-temperature relationship for the years 1945-1959, and without attempting to correct for increased fishing effort, it is forecast that 9.6 million pounds of bluefin will be landed in 1964 from waters north of the United States-Mexican Border. That is 2.7 million pounds more than the average for the years 1945-1959.

**Early Season Surveys:** The U. S. Bureau of Commercial Fisheries research vessel Black Douglas and the California Department of Fish and Game research vessel N. B. Scofield departed the latter part of May 1964 in a joint preseason albacore oceanographic survey. On May 1, Navy picket vessels began trolling for albacore at offshore stations.

Radio broadcasts were made to the fishing industry on the results of those early season studies. A radio report from the M/V Black Douglas stated that the first albacore were caught on June 7. A total of 61 albacore (ranging from 5 to 15 pounds) were caught in water 63° to 65° F. about 120 miles west-southwest

of Erben Bank, a seamount located about 1,000 miles due west of San Diego. The vessel report said that the tugboat Elaine Foss also caught 2 albacore on the same day in 65° F. water about 250 miles west of the area where the Black Douglas located the fish. The M/V N. B. Scofield reported catching one 13-pound albacore in 60° F. water on June 9, about 400 miles west of Point Conception. Radio broadcasts were being made daily by the research vessels until July 6, to provide information on the shoreward movement of the summer albacore movement.

Note: See Commercial Fisheries Review, July 1963 p. 55.



## U. S. Fishing Vessels

### FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, APRIL 1-JUNE 30, 1964:

From the beginning of the program in 1956 through June 30, 1964, a total of 1,487 loan applications for \$39,840,256 were received by the U. S. Bureau of Commercial Fisheries, the Agency administering the Federal Fisheries Loan Fund. Of the total, 791 applications (\$17,802,763) had been approved, 504 (\$12,270,419) had been declined or found ineligible, 171 (\$6,394,505) had been withdrawn by the applicants before being processed, and 21 (\$1,406,700) were pending. Of the applications approved, 299 were approved for amounts less than applied for. The total reduction was \$1,965,869.

The following loans were approved from April 1, 1964, through June 30, 1964:

New England Area: James M. White, Peace Dale, R. I., \$4,340; Skipjack Fishing Corp., New Bedford, Mass., \$50,000; Stanley Ripley, Matinicus Island, Maine, \$2,000; Wallace K. Arey, Camden, Maine, \$1,600; Robert L. Goodspeed, Trevett, Maine, \$3,248; and Edward E. Benner, Jr., Round Pond, Maine, \$7,500.

California: Joseph A. Gann, et al, San Diego, \$131,200; William A. McPhee, Moss Landing, \$13,580; Eugene A. Smith, Isleton, \$2,000; San Juan, Inc., San Diego, \$690,000; Richard Robertson, Shell Beach, \$10,449; James Friscia, San Francisco, \$3,800; and Emerson Simmons, San Francisco, \$6,000.

South Atlantic and Gulf Area: Carl Lewis, Cape Charles, Va., \$3,000; James Strickland, Freeport, Tex., \$14,400; Eddie S. Gilden, Aransas Pass, Tex., \$21,787; and John Ross, Biloxi, Miss., \$15,752.

Great Lakes Area: Harold Lamb, Rogers City, Mich., \$4,000.

Pacific Northwest Area: William M. Suryan, Anacortes, Wash., \$9,160; David W. Carr, Seattle, Wash., \$5,000; Ora L. Olson, Snohomish, Wash., \$45,000; Ottar G. Larsen, Seattle, Wash., \$32,000; Nate Smith, Brookings, Oreg., \$5,000; Floyd D. Furfur, Westport, Wash., \$25,000; Knute Hillmar, Seattle, Wash., \$4,000; Allen K. Rhoades, Bay Center, Wash., \$6,289; Peter C. Rosberg, Burton, Wash., \$35,000; Roy E. Johnson, Seattle, Wash., \$59,000; Jack D. Durham, Seattle, Wash., \$17,400; Lloyd N. Whaley, Seattle, Wash., \$45,000; and Tony Franulovich, Anacortes, Wash., \$8,000.

Alaska: Douglas R. Putansu, Kodiak, \$8,000; Donald B. Foster, Kodiak, \$20,000; William R. Berestoff, Kodiak, \$42,000; Emil C. Christensen, Kodiak, \$18,500; Pete & Bill Walkoff, Kodiak, \$28,000; Bennett G. Groteclose, Kodiak, \$11,000; James Veach, Kodiak, \$6,000; James E. Veazey, Kodiak, \$17,000; John R. Boggs, Ozinkie, \$1,300; Jefferson Grey, Kodiak, \$25,000; Egbert Intvelt, Kodiak, \$1,500; Elmer E. Dean, Kodiak, \$13,000; Richard D. Kramer, Kodiak, \$4,800; Hans P. Olsen, Jr., Kodiak, \$0,000; Eugene N. McLeod, Kodiak, \$27,000; Aaron W. Bauder, Palmer, \$8,120; Turi Kivisto, Cordova, \$4,260; William F. Smith, Cordova, \$9,000; J. A. Rollin, Cordova, \$11,486; Ernest J. Galliher, Kodiak, \$40,875; Robert I. Ditman & George Hillar, Valdez, \$36,000; Jack E. Crowley, Juneau, \$2,600; Charles R. Leshier, Juneau, \$9,200; Jess E. Padon, Fort Alexander, \$8,315; Walter Cooper, Seward, \$14,000; LeRoy C. Hollman, Seward, \$8,970; Marvin Lyle Dragseth, Sutton, \$7,372; Arthur E. Foss, Kenai, \$16,000; Neil Sargent, Kodiak, \$3,200; Ben B. Sudduth, Ketchikan, \$4,500; Clifford E. Alexander, Homer, \$700; Adam J. Cichoski, Kodiak, \$5,000; Oliver & Samuel Selvig, Kodiak, \$8,776; Eli Metrokin, Kodiak, \$6,000; Larry S. Matfay, Old Harbor, \$4,500; Donald Hamilton, Ketchikan, \$9,500; Roy Will Allen, Haines, \$6,400; Morris Porter, Jr., Kenai, \$5,900; Trawlers, Inc., Seward, \$17,500; Charles R. Martin, Kodiak, \$4,880; William Yurioff, Kodiak, \$2,633; Peter P. Squartoff, Kodiak, \$1,000; Gerasim Pestrikoff, Sitka, \$22,800; Martin Goresen, Seward, \$6,175; Duke R. Jones, Kodiak, \$3,525; Herman Andrewvitch, Old Harbor, \$400; Raymond Kelly, Old Harbor, \$3,050; Paul N. Swenning, Old Harbor, \$6,000; Carl R. Christiansen, Old Harbor, \$650; and Edward Pestrikoff, Old Harbor, \$500.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the second quarter of 1964, a total of 5 applications for \$155,275 were received and 11 applications for \$381,809 were approved. Since the program began (July 5, 1960), 55 applications were received for \$4,896,614. Of the total, 44 applications were approved for \$2,970,221 and 3 applications for \$238,347 were pending as of June 30, 1964. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 11 (\$1,054,500), approved 8 (\$775,365).

California Area: Received and approved 1 (\$557,000).

South Atlantic and Gulf Area: Received 33 (\$1,384,090), approved 28 (\$1,075,336).

Pacific Northwest Area: Received 7 (\$1,846,250), approved 4 (\$507,546).

Alaska Area: Received 3 (\$54,774), approved 3 (\$54,774).

The large number of loan applications from Alaska during the period was the result of the March 27 earthquake there. In April, the Bureau of Commercial Fisheries opened an emergency Loan Office in Kodiak to arrange for loans to fishing vessel owners in the Kodiak area whose vessels or fishing gear were lost or damaged during the earthquake.

\* \* \* \* \*

### DOCUMENTATIONS ISSUED AND CANCELLED, MARCH 1964:

During March 1964, a total of 27 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 36 in March 1963. There were 39 documents cancelled for fishing vessels in March 1964, the same as in March 1963.

Table 1 - U. S. Fishing Vessels 1/- Documentation Issued and Cancelled, by Areas, March 1964 with Comparisons

Area (Home Port)	Mar. 1964	1963	Jan.-Mar. 1964	1963	Total 1963
(Number) . . . . .					
<b>Issued first documents 2/:</b>					
New England	-	1	2	4	23
Middle Atlantic	-	1	2	2	18
Chesapeake	4	3	9	6	66
South Atlantic	6	6	16	13	77
Gulf	13	17	50	40	239
Pacific	4	7	10	16	160
Great Lakes	-	1	1	1	5
Puerto Rico	-	-	-	-	2
<b>Total</b>	<b>27</b>	<b>36</b>	<b>90</b>	<b>82</b>	<b>590</b>
<b>Removed from documentation 3/:</b>					
New England	2	3	8	5	48
Middle Atlantic	-	5	3	15	47
Chesapeake	1	2	10	5	25
South Atlantic	5	4	15	14	53
Gulf	8	13	28	23	118
Pacific	20	11	35	26	87
Great Lakes	3	1	8	3	15
Hawaii	-	-	-	-	3
<b>Total</b>	<b>39</b>	<b>39</b>	<b>107</b>	<b>91</b>	<b>396</b>

Note: For explanation of footnotes, see table 4.

Table 2 - U. S. Fishing Vessels--Documents Issued by Vessel Length and Area, March 1964 2/

Length	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number) . . . . .					
27 - 27.9	-	-	-	1	1
34 - 34.9	-	-	1	-	1
36 - 36.9	1	-	-	-	2
37 - 37.9	2	-	-	1	3
40 - 40.9	-	-	-	1	1
41 - 41.9	1	-	-	-	2
42 - 42.9	-	-	1	1	1
44 - 44.9	-	-	1	-	1
47 - 47.9	-	1	-	-	1
49 - 49.9	-	-	-	1	1
53 - 53.9	-	-	1	-	1
54 - 54.9	-	1	-	-	1
57 - 57.9	-	1	-	-	1
58 - 58.9	-	-	2	-	2
61 - 61.9	-	-	1	-	1
62 - 62.9	-	-	2	-	2
64 - 64.9	-	-	1	-	1
65 - 65.9	-	3	1	-	4
<b>Total</b>	<b>4</b>	<b>6</b>	<b>13</b>	<b>4</b>	<b>27</b>

Note: For explanation of footnote, see table 4.

Table 3 - U. S. Fishing Vessels--Documents Issued by Tonnage and Area, March 1964 2/

Gross Tonnage	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number) . . . . .					
5-9	4	-	-	1	5
10-19	-	-	4	-	4
20-29	-	-	-	2	2
30-39	-	1	1	-	2
40-49	-	-	1	-	1
50-59	-	2	-	1	3
60-69	-	-	4	-	4
70-79	-	2	3	-	5
80-99	-	1	-	-	1
<b>Total</b>	<b>4</b>	<b>6</b>	<b>13</b>	<b>4</b>	<b>27</b>

Note: For explanation of footnote, see table 4.

Table 4 - U. S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, March 1964 2/

Horsepower	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number) . . . . .					
32	1	-	-	-	1
37	1	-	-	-	1
48	-	-	1	-	1
100	-	-	-	1	1
110	-	1	2	-	3
130	1	-	-	-	1
165	-	1	1	1	3
170	-	1	4	-	5
175	1	-	-	-	1
180	-	-	1	1	2
220	-	-	2	-	2
270	-	-	1	-	1
300	-	2	1	1	4
325	-	1	-	-	1
<b>Total</b>	<b>4</b>	<b>6</b>	<b>13</b>	<b>4</b>	<b>27</b>

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/There were no redocumented vessels in March 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 21 in 1964; 1 in 1961; 1 in 1958; and 4 prior to 1951.

3/Includes vessel reported lost, abandoned, forfeited, sold alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



## U. S. Foreign Trade

### IMPORTS OF CANNED TUNA (BRINE) UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 30, 1964, amounted to 14,496,778 pounds (about 690,320 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

\* \* \* \* \*

### PROCESSED EDIBLE FISHERY PRODUCTS, APRIL 1964:

United States imports of processed edible fishery products in April 1964 were down 6.5 percent in quantity and 5.4 percent in value from those in the previous month. There was a general decline in imports of most fish fillet items as well as canned sardines in oil and canned oysters. Imports were up for canned albacore tuna in brine, canned sardines not in oil, and canned crab meat.

Compared with the same month in 1963, imports in April 1964 showed little change in overall totals. A gain this April in imports of fish blocks and slabs, canned sardines not in oil, and canned crab meat was about offset by smaller ship-

U. S. Imports and Exports of Processed Edible Fishery Products,  
April 1964 with Comparisons

Item	Quantity				Value			
	Apr.	Jan.-Apr.	Apr.	Jan.-Apr.	Apr.	Jan.-Apr.	Apr.	Jan.-Apr.
1964 1963	1964 1963	1964 1963	1964 1963	1964 1963	1964 1963	1964 1963	1964 1963	1964 1963
.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of Lbs.) ..	.. (Millions of \$) ..	.. (Millions of \$) ..	.. (Millions of \$) ..	.. (Millions of \$) ..
Fish & Shellfish:								
Imports 1/ ..	40.3	40.6	168.3	165.3	12.2	12.3	49.4	47.0
Exports 2/ ..	3.0	1.6	14.9	12.6	1.7	0.8	6.4	4.9

1/ Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/ Excludes fresh and frozen.

ments of groundfish fillets, sea catfish fillets, canned tuna in brine, canned sardines in oil, and canned oysters.

In the first 4 months of 1964, imports were up 1.8 percent in quantity and 5.1 percent in value from those in the same period of 1963. During January-April 1964 there were larger imports of groundfish fillets, flounder fillets, blocks and slabs, sea catfish fillets, and yellow pike fillets. But imports were down for swordfish fillets, canned sardines in oil and not in oil, and canned tuna in brine.

Exports of processed edible fish and shellfish from the United States in April 1964 were up 20 percent in quantity and 70 percent in value from those in the previous month. In April, there was a sharp increase in exports of canned salmon as well as larger shipments of canned sardines not-in-oil. The gain was partly offset by a drop in shipments of canned mackerel and canned sardines in oil.

Compared with the same month of the previous year, the exports in April 1964 were up 87.5 percent in quantity and 112.5 percent in value. This April there were larger shipments of all leading canned fish export items except canned squid.

Processed fish and shellfish exports in the first 4 months of 1964 were up 18.3 percent in quantity and 30.6 percent in value from those in the same period of 1963. In January-April 1964 there were much larger shipments of canned mackerel and shipments of canned sardines in oil and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown were included in news articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed fishery products are reported. The import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, July 1964 p. 36.



## U. S. Research Vessels

### "DELAWARE II" TO BE BUILT AS NEW EXPLORATORY FISHING RESEARCH VESSEL

A contract for the construction of a 155.5-foot fisheries research vessels has been awarded to a shipbuilding firm in South Portland, Maine, by the U. S. Bureau of Commer-

cial Fisheries. The vessel is to be operated by the Bureau's Exploratory Fishing Base, Gloucester, Mass., and will replace the veteran research vessel Delaware. The new vessel will be named Delaware II and will continue fisheries investigation work in the North Atlantic.

The design and construction of the Delaware II will enable the ship to operate from subarctic regions to the tropics in all seasons. Stores and fresh-water provisions will allow the vessel to remain at sea for 30-day periods. Fuel oil capacity is sufficient to provide an 8,000-mile cruising radius. Air-conditioned quarters are provided for a complement of 6 scientists and 13 crew members. The Delaware II will be equipped with two laboratories and a special chartroom. To aid scientific investigations, the vessel will also be provided with sophisticated electronic fish-detecting equipment and an underwater television system for observing the operation of fishing gear and its effect upon fish.

Of special interest is the deck layout, featuring a new concept in stern trawling. The stern is fitted with a sloping ramp running from waterline to the main deck. A passage, 10 feet wide, extends the entire length of the vessel to the trawl winch, which is located forward. Those features allow the trawl to be hauled aboard in a single, fast, efficient operation. The deckhouse, through which the trawl passage runs, affords protection for the crew while working on the net and the catch. Capabilities for side trawling, long-lining, gill-netting, and purse-seining are also provided.

Facilities will be provided to allow future research on methods of preserving and processing fish at sea. Included are equipment for ice-making, brine- and blast-freezing, and irradiation. The vessel's insulated hold will have a 16-ton freezing capacity.

The principal specifications of the Delaware II are: length overall 155.5 feet, beam 30 feet, draft 11.5 feet, displacement (full load) 680 tons, and deadweight 180 tons.

The Delaware II will be powered by a 1,000 hp.-Diesel engine, driving a solid wheel through reduction gears, which will enable the vessel to cruise at 12.5 knots. Two 115-kilowatt a.c. generators will supply the vessel's regular power demand, as well as pow-



er for experimental fishing techniques, such as electro-fishing.

It is believed that the new vessel, in addition to efficiently carrying out the objectives of the Bureau's research programs, will provide an example to the United States fisherman of a modern concept in efficient trawler design.



## Washington

### SALMON TAGGING IN PUGET SOUND CONTINUED:

The purse-seiners Welcome, Victory, and Sykes have been chartered for salmon tagging during August and September 1964 in northern Puget Sound by the Washington State Department of Fisheries. The 3 vessels will operate during weekly 2- and 3-day closures of net fishing. They will tag fish at West Beach, Rosario Strait, Iceberg Point, Salmon

Banks, Lime Kiln, Mitchell Bay, and Stuart Island. Biologists from the Washington State Department of Fisheries will be on board the vessels at all times during tagging. The project is part of a continuing program to learn more about the migration patterns of adult salmon. (Washington State Department of Fisheries, May 29, 1964.)



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, JUNE 1964:

There was only a slight increase (0.2 percent) from the previous month in the June 1964 wholesale price index for edible fish and shellfish (fresh, frozen, and canned). But prices for most salt-water fishery products this June were higher than in May. Processed frozen fish and shellfish was the only subgroup index that rose from May to June, solely because of higher frozen shrimp prices in June. At 105.6 percent of the 1957-59 average, the index this June was 7.7 percent lower than for the same month a year earlier. June 1964 prices for most items were generally lower than in June 1963.

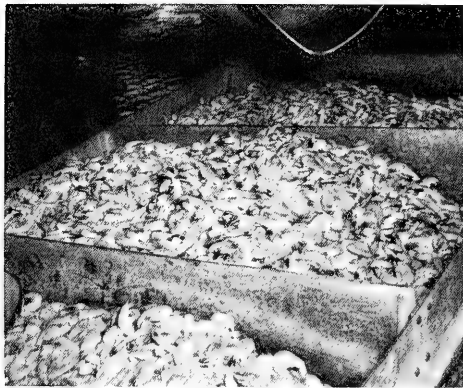
Prices this June were mostly lower in the drawn, dressed, or whole finfish subgroup and the index was down 1.1 percent

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			June 1964	May 1964	June 1964	May 1964	Apr. 1964	June 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					105.6	105.4	103.1	114.4
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					107.8	107.4	103.7	120.5
<b>Drawn, Dressed, or Whole Finfish:</b> . . . . .					106.3	107.5	88.4	109.7
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.10	.08	75.2	60.5	67.4	97.9
Halibut, West., 20/80 lbs., drsd., fresh or froz. . . . .	New York	lb.	.36	.34	107.0	101.5	82.8	106.4
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.89	.92	124.7	127.8	116.3	118.8
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.43	.62	63.4	92.5	84.3	84.3
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.43	.58	69.6	94.2	69.6	76.2
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					114.8	117.2	115.0	135.1
Fillets, haddock, sm., skins on, 20-lb. tins . . . . .	Boston	lb.	.32	.30	77.7	71.6	75.3	100.8
Shrimp, lge. (26-30 count), headless, fresh . . . . .	New York	lb.	1.00	.99	117.2	116.0	111.3	133.0
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.00	7.50	118.0	126.5	126.5	143.3
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					98.7	94.7	94.7	113.1
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.37	.37	92.5	92.5	93.8	100.1
Haddock, sm., skins on, 1-lb. pkg. . . . .	Boston	lb.	.35	.36	101.1	104.1	107.0	102.6
Ocean perch, lge., skins on 1-lb. pkg. . . . .	Boston	lb.	.30	.30	105.2	105.2	108.7	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg. . . . .	Chicago	lb.	.82	.75	96.6	88.3	86.6	118.6
<b>Canned Fishery Products:</b> . . . . .					102.2	102.2	102.5	104.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	22.25	22.25	97.0	97.0	95.9	104.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.50	11.50	102.1	102.1	103.3	99.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	6.25	6.13	105.9	103.9	103.9	100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.81	8.86	113.0	113.7	116.5	113.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



Fresh East Coast shrimp on display at one of the stands in the New York City Fulton Fish Market.

from the previous month. Prices this June were sharply lower for Great Lakes fresh-water fish and fresh and frozen king salmon at New York City (down 2.4 percent from the previous month). But prices were higher for ex-vessel large haddock (up 24.3 percent) at Boston and fresh and frozen halibut (up 5.4 percent) at New York City. Compared with June 1963, prices in the subgroup this June were lower (by 3.1 percent) for all products, except salmon (up 5.0 percent) and halibut (up 0.6 percent). From June a year earlier, ex-vessel large

haddock prices were down 23.3 percent and Lake Superior whitefish prices were sharply lower by 24.8 percent this June.

The subgroup index for processed fresh fish and shellfish in June 1964 was down 2.0 percent from the previous month. From May to June prices were lower for shucked standard oysters (wholesale price down 50 cents a gallon) at Norfolk. The lower prices for oysters were offset by increases in prices for fresh haddock fillets (up 8.5 percent) at Boston and fresh shrimp (up 1.0 percent) at New York City. Compared with June 1963, the subgroup index this June was down 15.0 percent because prices for all items in the subgroup were down substantially.

In the subgroup for processed frozen fish and shellfish there were price changes only for frozen shrimp and haddock fillets with the index up 4.2 percent from the previous month. Prices for other items in the subgroup were unchanged from May to June. A stronger market for frozen shrimp at Chicago saw higher prices (up 9.4 percent) than in the previous month, but prices for haddock fillets were lower by 2.8 percent. As compared with June 1963, prices for all items in the subgroup were considerably lower this June and the index was down 12.7 percent.

The subgroup index for canned fishery products was unchanged from May to June because higher prices for California canned jack mackerel (up 1.9 percent) were offset by a slight drop in prices for canned Maine sardines (down 0.6 percent). Prices for canned pink salmon this June were the same as in May but were 7.3 percent lower than in June 1963. Stocks of canned pink salmon on June 1, 1964, were reported liberal and estimated to be several hundred thousand cases above normal for that date. Stocks of canned jack mackerel were below normal due to lower California landings of that species. Prices for canned Maine sardines were lowered by some distributors in anticipation of the new-season pack. The subgroup index this June was lower than for the same month a year earlier by 1.8 percent principally because of lower pink salmon prices.



### NORTH AMERICAN CATFISH ARE SOLICITOUS PARENTS

Catfish are known to be careful parents. Many of them build nests and take care of their young after they hatch. Fresh-water catfish can sometimes be seen near the edge of lakes in early summer as one of the parents, usually the father, patiently swims near his brood of finger-sized, dark-colored offspring.

There are about two dozen kinds of catfish in the world. Our North American catfish belong to two families--the fresh-water (Ictaluridae) and the salt-water (Ariidae).

Many catfish males carry the eggs in their mouths, sometimes for a few months. After the eggs hatch, the male catfish carries on with his parental duty by following the tiny offspring, opening his mouth for them to flee inside at the first sign of danger.

They are called catfish because of the whiskers (barbels) around their head, and there are many superstitions about them, including the nickname, children of the devil.

Catfish have spines in the fins which can cut the hand of a careless angler. A gland near the base of the spine secretes a substance that increases the swelling and painfulness of the wound. (Science News Letter, June 20, 1964.)



# FOREIGN

## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MARCH 1963-1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Production and exports of fish meal by FEO countries during January-March 1964 were up substantially from that same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-March 1963-1964

Country	February		March		Jan.-Mar.	
	1964	1963	1964	1963	1964	1963
..... (1,000 Metric Tons) .....						
Chile .....	13.9	1/	17.2	1/	42.9	1/
Angola .....	2/	2.8	2/	1.8	2/	7.4
Iceland .....	8.5	7.3	11.7	5.7	31.7	22.1
Norway .....	13.5	5.5	13.0	8.9	53.7	22.6
Peru .....	100.7	104.1	186.1	103.9	388.7	355.3
So. Africa (inc. S.W. Africa) ..	11.2	8.9	20.0	12.8	44.6	28.5
Total .....	147.8	128.6	248.0	133.1	561.6	435.9

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-March 1963-1964

Country	February		March		Jan.-Mar.	
	1964	1963	1964	1963	1964	1963
..... (1,000 Metric Tons) .....						
Chile .....	21.3	1/	4.3	1/	47.4	1/
Angola .....	2/	2.9	2/	1.6	2/	7.2
Iceland .....	5.5	6.6	8.8	5.4	21.0	21.5
Norway .....	6.4	3.0	28.2	3.7	43.2	10.4
Peru .....	125.2	45.8	175.2	122.0	495.9	313.5
So. Africa (inc. S. W. Africa) ..	16.4	15.9	33.4	21.3	63.8	47.0
Total .....	175.8	74.2	249.9	154.0	671.3	399.6

1/ Data not available. Chile became a member of FEO at the end of 1963.  
2/ Data not reported.

During the first quarter of 1964, Peru accounted for 69.2 percent of total fish-meal exports reported by FEO countries, followed by Norway with 9.6 percent, South Africa with 7.9 percent, Chile with 7.6 percent, and Iceland with 5.7 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 3, 1964.)

\* \* \* \* \*

## WORLD PRODUCTION:

March 1964: World fish meal production in March 1964 was substantially above that in the same month of the previous year, according to preliminary data from the International Association of Fish Meal Manufacturers. Compared with the previous month, production in March 1964 was up 38.8 percent due mainly to heavier output in Peru, Norway, and South Africa.

World Fish Meal Production by Countries,  
January-March 1963-1964

Country	March		Jan.-Mar.	
	1964	1963	1964	1963
..... (Metric Tons) .....				
Canada .....	4,227	4,848	11,000	25,613
Denmark .....	3,810	5,499	15,017	18,611
France .....	1,100	1,100	3,300	3,300
German Federal Rep. ..	6,388	8,110	19,535	19,872
Netherlands .....	1/	100	1/	900
Spain .....	1/	3,400	1/	7,016
Sweden .....	527	324	2,012	1,207
United Kingdom .....	6,438	7,080	21,128	20,003
United States .....	2,723	2,420	6,053	7,755
Angola .....	1/	1,648	2/5,566	7,553
Iceland .....	8,771	5,441	21,028	21,470
Norway .....	28,221	3,664	43,238	10,370
Peru .....	175,170	122,030	495,937	313,537
So. Afr. (incl. S.W. Afr.)	34,188	21,459	65,437	48,089
Belgium .....	375	375	1,125	1,125
Chile .....	4,291	1/	47,409	1/
Morocco .....	1/	1/	1/	1/
Total .....	276,229	187,498	757,785	505,741

1/ Data not available.

2/ Data available only for January 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in the first 3 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 65 percent of world output during January-March 1964. There was also a noticeable increase in Norwegian and South African production in January-March 1964. The gain was offset partly by a sharp drop in Canadian output.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

\* \* \* \* \*

February 1964: World fish meal production in February 1964 was substantially above that in the same month of the previous year, according to preliminary data from the International Association of Fish Meal Manufacturers. Compared with the previous month, production in February 1964 was down 29 percent due mainly to lower output in Peru.

## International (Contd.):

World Fish Meal Production by Countries, January-February 1963-1964				
Country	February		Jan.-Feb.	
	1964	1963	1964	1963
(Metric Tons)				
Canada	3,368	13,249	6,773	20,765
Denmark	2,408	6,994	11,207	13,112
France	1,100	1,100	2,200	2,200
German Federal Rep.	6,390	5,787	13,147	11,762
Netherlands	1/	500	1/	800
Spain	1/	1,531	1/	3,616
Sweden	415	439	1,485	883
United Kingdom	6,954	6,480	14,690	12,923
United States	1,663	2,583	3,330	4,655
Angola	1/	2,949	2/5,566	5,905
Iceland	6,521	6,553	12,257	16,029
Norway	6,410	3,047	15,017	6,706
Peru	125,216	45,848	320,767	191,507
So. Afr. (incl. S.W. Afr.)	16,947	16,108	31,249	26,630
Belgium	375	375	750	750
Chile	21,270	1/	43,118	1/
Morocco	1/	1/	1/	1/
Total	199,037	113,543	481,556	318,243

1/ Data not available.

2/ Data available only for January 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in the first two months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 66 percent of world output during January-February 1964. There was also a noticeable increase in Norwegian and South African production in January-February 1964. The gain was offset partly by lower output in Canada, Denmark, the United States, and Iceland.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

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### SUPPLY INDICATORS FOR PRINCIPAL EXPORTING AND IMPORTING COUNTRIES, 1963:

The Fish Meal Exporters Organization (FEO) has estimated world fish meal production in 1963 at 2,800,000 metric tons (exclud-



Fish Meal Supply Indicators for Principal Exporting and Importing Countries, 1963			
Principal Exporting Countries	Production	Exports	Domestic Consumption <sup>1/</sup>
	(Metric Tons)		
Peru	1,159,200	2/1,169,700	38,200
South Africa Republic	238,000	198,800	26,400
Norway	132,100	104,000	28,400
Chile	90,400	86,800	13,000
Iceland	87,190	99,000	4,100
Angola	31,400	30,000	600
Denmark	2/86,900	46,900	35,000
Canada	77,400	56,900	3/
Morocco	2/21,000	19,000	2,000
Total	1,923,590	1,811,100	147,700
Principal Importing Countries	Production	Imports	Total Production and Imports
	(Metric Tons)		
United States	219,200	347,200	566,400
Japan	350,000	90,000	440,000
West Germany	74,000	295,300	369,300
United Kingdom	75,100	281,500	356,600
Netherlands	7,000	175,600	182,600
Spain	25,000	81,000	106,000
France	13,000	76,500	89,500
Italy	1,500	61,200	62,700
Belgium	4,000	48,800	52,800
Sweden	6,600	29,900	36,500
Switzerland	-	21,100	21,100
Eastern European countries	3/	160,559	3/
Total	775,400	1,668,659	2,444,059

1/Estimated.

2/Revised.

3/Not available.

Note: There may be small discrepancies between data shown above and previously published fish meal production and foreign trade data for selected countries.

Source: Fish Meal Exporters Organization.

1/ Estimated.

2/ Revised.

3/ Not available.

Note: There may be small discrepancies between data shown above and previously published fish meal production and foreign trade data for selected countries.

Source: Fish Meal Exporters Organization.

ing production data for Communist China and the Soviet Union which are unavailable). A large part of world production enters into foreign trade. The United States and the countries of Western Europe are the leading buyers.

### FOOD AND AGRICULTURE ORGANIZATION

#### INTERNATIONAL SYMPOSIUM ON HOW TO KEEP FISH FRESH:

How to get fish to the consumer in the best possible condition was studied by some 100 scientists from 17 countries during a symposium held in Husum, West Germany, May 26-30, 1964. The Husum meeting, which was sponsored by the Food and Agriculture Organization (FAO), was a "Symposium on the Significance of Fundamental Research in the Utilization of Fish." It surveyed the existing scientific information in that field and drew up a list of priorities for further study. Those priorities will be passed on to fisheries research institutions around the world.

The Husum meeting marks the first time that those problems have been the subject of

## International (Contd.):

a scientific meeting on a worldwide basis. About 45 papers and technical notes were presented.

The Symposium's work began with a review of the various factors affecting the quality of fish and was divided into four major areas: (1) reducing the high protein losses which occur in fish and fishery products between the fisherman's boat and the market; (2) surveying the quality tests for both fresh and frozen fish developed and carried out in various countries; (3) improving processing methods and developing new ones; and (4) providing more fish for human consumption by the development of new fishery products.

The Symposium was held under the auspices of the Government of the Federal Republic of Germany and the Nutrition Advisory Committee of the West German fisheries industry. (Food and Agriculture Organization Press Release, Rome, May 15, 1964.)

## INTERNATIONAL PACIFIC HALIBUT COMMISSION

## HALIBUT FISHING

RESTRICTIONS PROPOSED:

Halibut fishing in the catch-limit area of the Bering Sea is tentatively scheduled for closure in 1965, and further restrictions are being considered on North Pacific halibut fishing off the United States and Canadian coasts.

The announcement was made by the International Pacific Halibut Commission (IPHC) at the close of a special meeting of the Commission at Seattle, Wash., on June 4, 1964. The purpose of that meeting was to examine recent developments in the Pacific halibut fishery, and particularly those in the Eastern Bering Sea where there has been a serious decline in the fishery. The IPHC represents the United States and Canadian Governments in regulating halibut fishing in the North Pacific.

Closure of the Bering Sea to halibut fishing was predicted after it became apparent that the area there was fished out by the combined fishing fleets of the United States, Canada, and Japan.

Continued poor halibut fishing in Area 2, extending from Willapa Bay to Cape Spencer in Alaska, was relatively unexpected and has caused more concern over the state of the North Pacific halibut fishery.

With regard to halibut fishing in the Bering Sea, the Commission's Chairman, Harold E. Crowther, expressed deep concern and said, "Unless there is marked improvement in the halibut stocks, it will be necessary to recommend closure of the Bering catch-limit area in 1965."

"The Commission intends to keep the fishery in this area under careful review, and if conditions continue to deteriorate, more immediate action may be required."

"In view of conditions prevailing in other sections of the Pacific coast, particularly in Area 2, close surveillance of the fishery will be maintained in the event further restrictions in these areas are required." In 1963, the combined fleets of the three nations failed to land the expanded limit. This year the halibut quota in the area in the Bering Sea designated as



Fresh halibut being unloaded with a cargo net from the hold of an halibut fishing vessel at Seattle, Wash.

Area 3B North Triangle was cut sharply, but fishermen found almost no halibut on those grounds.

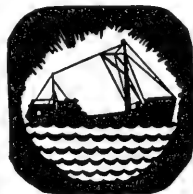
In Area 2, the situation appears to be less desperate. Only the traditional United States and Canadian fleets have been allowed to fish in that area. However, fishermen failed to catch the full quota of 28 million pounds in Area 2 last year. This year, with the quota cut down to 25 million pounds, fishermen have continued to make a disappointing showing in that area which in the past has produced almost half the halibut harvest of the North Pacific.

At the June 4 special meeting, the Halibut Commission conferred with representatives of the fishermen, fishing vessel owners, and brokers and processors from Washington, British Columbia, and Alaska.

## INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

## 14TH ANNUAL MEETING HELD AT HAMBURG:

The 14th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF) was held at Hamburg, Germany, June 1-6, 1964. Member Countries attending the Annual Meeting were Canada, Denmark, France, Federal Republic



## International (Contd.):

of Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, Soviet Union, United Kingdom, and the United States.

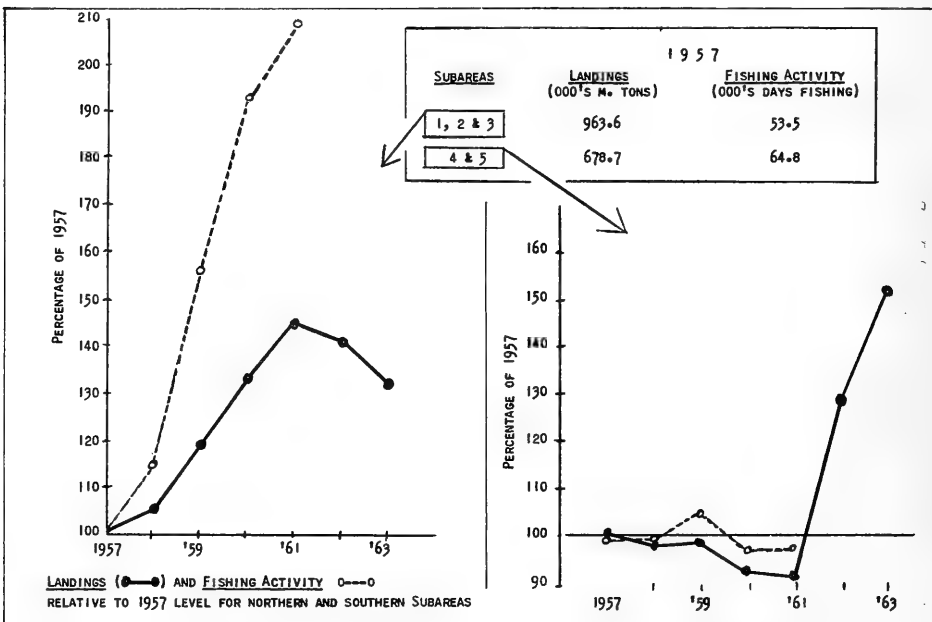
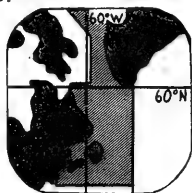
Various preliminary meetings were held starting on May 21. These were meetings of the (1) Ad Hoc Group on Pelagic Fishes; (2) Subcommittee on Fishery Assessment; (3) Standing Committee on Research and Statistics; and (4) Scientific Advisers to Panels on May 30, which was followed by the Annual Meeting on June 1.

At the 1964 Annual Meeting, a report was given on the present status of the fisheries in which it was concluded that the intensity with which many of the major stocks of cod and haddock are now being fished is near that at which they can provide their greatest sustained catches. That report included an analysis

of recent trends and changes in the fishing activity and catches of fish which show that the increased fishing over the past six years in the Northwest Atlantic has not been matched, especially in the northern part of the Northwest Atlantic, by corresponding increases in the amount of fish landed. The report further showed that mesh-size regulations, while helping to keep up the total catches, could not offset the expected decrease in the ratio of "catch landed" to "fishing effort expended" if fishing continues to increase.

At the meeting, each of the 13 Member Countries reported its 1963 catch of fish from the Convention Area which extends from Greenland to Rhode Island. The total landings amounted to some 5.7 billion pounds, about the same as in 1962.

Although the 1963 catches of cod and ocean perch declined somewhat, the total from the Convention Area was maintained by the Soviet Union's large catch of whiting (silver hake). The U.S.S.R. reported taking 235 million pounds of that species from Georges Bank and



Trends and changes in Northwest Atlantic catches and fishing activity, 1957-63.

## International (Contd.):

270 million pounds from the Sable Island area in 1963.

The total United States landings from the Convention Area dropped from 1.1 billion pounds in 1962 to 933 million pounds in 1963.

Canada traditionally has been the largest producer in the area and still is. Her catch amounted to 1.5 billion pounds in 1963 compared with 1.6 billion pounds in 1962.

The U.S.S.R., which started fishing in the Convention Area in 1958, rose from third place in 1962 to second place in 1963 in terms of quantity of fish taken from the Area.

Japan, which is not a member of the Commission, sent observers to the 14th Annual Meeting and reported that she now has four trawlers engaged in experimental fishing operations in the area. Other observers present were from the Food and Agriculture Organization (FAO), the Fisheries Laboratory, Aberdeen, Scotland, and from a private United States foundation.

In reviewing the report of its scientific committee on research and statistics, the Commission noted that the amount of fishing in the area has increased markedly during the past few years but that the total amount of fish taken is leveling off. The scientists reported that it is unlikely that further increases in fishing effort will result in greatly increased returns. For this reason the Commission asked its scientific committee to make a study of the feasibility of regulating fishing in the area by means other than mesh regulations.

The Commission already has under regulation the size of meshes used in trawl nets for some species of fish, but no action has been taken to regulate the amount of fishing in the area. The present regulations establishing the minimum size of mesh to be used in a fishing net were drafted for use in the Commission years ago when manila was the principal fiber used for making trawl nets. At the 1964 meeting, the regulations were changed and brought up-to-date to meet the growing and widespread use of synthetic fibers. In this matter the Commission took the advice of its scientists who had compiled and analyzed experimental evidence on the way that meshes of different sizes and ma-

terials select the different sizes of commercial fish available.

Progress was made in the matter of the international enforcement of Commission regulations. At present each country polices its own fishing fleet, but it has been considered desirable for some years now that some kind of international system be set up to assist in the enforcement of regulations. Although no such system was recommended at this meeting, the Commission encouraged countries to exchange management personnel on an invitation basis during the coming year so that countries could become familiar, first hand, with the kinds of problems faced by management personnel of other countries. Countries were requested to file with the Commission by January 1, 1965, reports on the enforcement systems used by their respective governments.

The increasing number of fishing boats active on both sides of the Atlantic is creating navigational hazards which are accentuated by the fact that the practices of different fleets are not the same. The Commission recommended that all countries accept an invitation to a conference which will likely be held soon to draft an agreement embodying a modern code for the conduct of fishing operations in the North Atlantic.

At the meeting, all Member Countries of ICNAF indicated their intention to take the necessary final step to enable the Commission to include in its functions matters on the conservation of the harp and hood seals.

United States Commissioners at the meeting included Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, and a delegation of 11 advisers. Secretary Briggs was reelected as Vice Chairman of the Commission for the coming year. Ronald W. Green of Augusta, Me., was elected Chairman of the Committee on Finance and Administration.

The 15th Annual Meeting of ICNAF will be held in Halifax, Nova Scotia, Canada, on June 7, 1965.

Note: See Commercial Fisheries Review, July 1964 p. 42; August 1963 p. 75.

INTERNATIONAL COUNCIL FOR THE  
EXPLORATION OF THE SEANEW DRAFT CONVENTION TO BE  
CONSIDERED AT ANNUAL MEETING:

A new draft convention for the International Council for the Exploration of the Sea (ICES)

### International (Contd.):

will be considered at a meeting of representatives of Member Governments of that organization on September 7, 1964. The meeting is expected to be convened by Denmark's Foreign Ministry, with expectations that the new Convention would be signed by authorized Government representatives by the time the meeting ended. No non-member observers will be invited to the meeting.

The new Convention would clarify the international status of the ICES and its personnel, and make possible more adequate arrangements for suitable quarters than in Charlottenlund, located north of Copenhagen. Final ratification of the new Convention would be hoped for by that organization's October 1965 annual meeting.

Neither the ICES nor its personnel have had the usual international status of an organization of its type. With the acceptance of the new convention those problems would be corrected. It was conjectured that Denmark might provide new quarters or that the Member Governments of ICES might contribute jointly to a building. (United States Embassy, Copenhagen, April 29, 1964.)

### INTERNATIONAL INDIAN OCEAN EXPEDITION

#### INDIA'S OCEANOGRAPHIC RESEARCH PROGRAM:

A meteorological vessel (NOMAD), which will function as an automatic weather station, was launched in the Bay of Bengal during April 1964. The vessel was made available to India's Meteorological Department by the National Science Foundation to provide meteorological data for the Indian program of the International Indian Ocean Expedition (IIOE).

India proposes to undertake intensive oceanographic investigations on the Continental Shelf and superjacent waters along her coasts including northern parts of the Arabian Sea, northern Indian Ocean and parts of the Bay of Bengal with the help of her four research vessels. Two of the research vessels, the INS Kistna and R.V. Varuna, have already made extensive physical oceanographic observations with special reference to temperature, salinity, and oxygen in those areas.

Other programs envisaged during the IIOE include: (1) direct observational study of the properties of oceans; (2) exploration of areas

of potential fisheries; (3) detailed study of the atmospheric circulation of the monsoon region; and (4) studies of the bottom topography and temperature structure of the ocean. The various programs of study will help in exploitation of the ocean's productivity, improvement of weather forecasting services, and better understanding of the monsoon cycle.

India's IIOE program of marine biology and fisheries will be mainly directed to exploring areas of high productivity and potential fisheries which could be developed and exploited. Apart from plankton collections and measurement of primary productivity, experimental fishing using different types of gear will also be undertaken. Some of the problems suggested for Indian work are: (1) studies of phyto- and zooplankton and benthos; (2) the distribution of dissolved oxygen and its relation to biological productivity of waters; (3) critical studies of the euphotic zone in relation to variations; and (4) special biological, physiological and life history studies on selected groups including various oceanic animals and birds. (United States Embassy, New Delhi, May 18, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 23; January 1964 p. 26.

### INTERNATIONAL WHALING COMMISSION

#### 16TH ANNUAL MEETING HELD:

The 16th annual meeting of the International Whaling Commission was held in Sandefjord, Norway, June 15-26, 1964. At the meeting, the Commission's Scientific Committee was to discuss implementation of the agreement to station international observers in the Antarctic during the annual whaling season.

### NORTHEAST ATLANTIC FISHERIES COMMISSION

#### SECOND MEETING HELD AT THE HAGUE:

The Northeast Atlantic Fisheries Commission (NEAFC) held its second meeting at the Hague, May 12-15, 1964, with delegations present from all member countries which include Belgium, Denmark, Federal Republic of Germany, France, Iceland, Ireland, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, the United Kingdom, and the Soviet Union. Observers were present from the United States, the International Council for the Exploration of the Sea (ICES), and the International Commission for the Northwest Atlantic Fisheries (ICNAF).

At the meeting in The Hague, the Northeast Commission agreed on the following:



## International (Contd.):

(1) A codification of the conservation measures inherited from the Permanent Commission under Article 16 of the 1959 Convention of the Northeast Atlantic Fisheries was approved.

(2) Minimum mesh sizes of nets applicable in the northern part of the 1946 (predecessor) Convention area should apply to the 1959 Convention area between 42° and 44° W. and between 32° and 51° E. For the present, minimum sizes of mesh of nets were specified for the 1959 Convention area south of 48° north.

(3) The United Kingdom replaced the Federal Republic of Germany on Regional Committee 3, in accordance with their wishes.

(4) Permission to use top-side chafers was extended to January 1966. The ICES was requested to arrange for a detailed assessment of the various types of chafers in use in the Convention area and their effect on selectivity. Member Governments were asked to supply the Commission with additional information on types of chafers in use in their fishing industries and the effect on selectivity of nets. In particular, they were asked to explain any objections they may have to the top-side chafer specified by the Commission and the top-side chafer of the multiple-flap type.

(5) The ICES was requested to renew the activity of the Arctic Fisheries Working Group for a further study and reassessment of Arctic stocks.

(6) The ICES was requested to review the information available on the state of the stocks of the spiny dogfish and to advise the Commission on the effects of possible conservation measures.

(7) The ICES was requested to continue its study of the state of herring stocks in the Convention area.

(8) The provisions of Article 16 of the 1959 Convention which permit small fishing craft (primarily Danish) to fish for whiting in the Skagerrak and Kattegat Seas with small-mesh nets were extended until January 1, 1970.

(9) A Special Committee was established to study the practical problems involved in the establishment of international measures of

control on the high seas for the purpose of ensuring application of the Convention and the measures in force thereunder, as provided for in Article 13. Member Countries were asked to supply the Commission with a current account of their methods of national control. The Special Committee should be convened, if convenient, at the time and place of the Technical Conference on Policing to be called by the United Kingdom, possibly in the fall of 1964.

(10) The provisional budget for the year ending June 30, 1965 should be £3,730 (\$10,444).

(11) The next NEAFC meeting will be held in Moscow on May 11, 1965. (United States Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 20, 1964.)

## ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

## JAPAN JOINS OECD:

On April 28, 1964, Japan became the 21st member of the Organization for Economic Cooperation and Development (OECD). Japan deposited ratification documents for the treaty between Japan and the OECD with the French Government, the custodian of such documents for OECD members. The action followed the Japanese House of Councillors' approval of the OECD codes and resolutions, and the treaty admitting Japan.



The Japanese Foreign Minister said that Japan should be able to solve its pending economic problems effectively through bilateral negotiations and through multilateral organizations such as the OECD, the General Agreement on Tariffs and Trade (GATT), the United Nations, and the International Monetary Fund (IMF).

The Japanese Minister of International Trade and Industry stated that he intends to make efforts to eliminate trade discriminations against Japan by taking advantage of Japan's official entry into the OECD, and that his ministry would strive to strengthen the nation's industrial foundation so that Japan may withdraw various reservations it has made in connection with its trade liberalization duties. (Japan Report, May 15, 1964.)

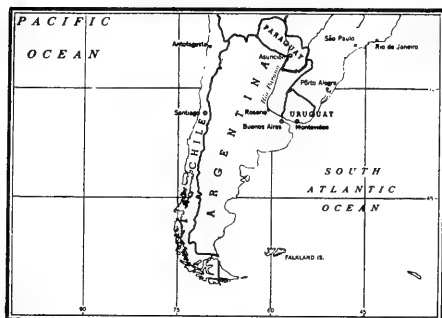
Note: See *Commercial Fisheries Review*, October 1963 p. 43.



## Argentina

### FISH MEAL AND OIL PRODUCTION AND EXPORTS, 1962-1963:

Production of fish meal from salt-water fish has expanded rapidly in Argentina during the last 2 years and the industry now has an annual capacity of about 12,000 tons of fish meal. Fish oil production in Argentina also increased in 1963.



Argentina's Production and Exports of Fish Meal and Oil, 1962-1963		
	1/1963	1962
...	(Metric Tons) ...	
<b>Production:</b>		
<b>Fish meal:</b>		
Salt-water . . . . .	6,636.4	3,248.0
Fresh-water . . . . .	1,418.9	1,273.0
<b>Fish oil:</b>		
Fish-body oil . . . . .	1,135.9	718.5
Shark-liver oil . . . . .	63.1	0.7
<b>Exports:</b>		
Fish oil . . . . .	472.1	383.3
Fish meal . . . . .	3,211.1	1,584.4
1/Preliminary.		

Exports of industrial products expanded along with production in 1963, with West Germany being the principal market for Argentine fish meal and most of the fish oil going to the Netherlands. (United States Embassy, Buenos Aires, May 14, 1964.)

Note: See Commercial Fisheries Review, Dec. 1963 p. 54.



## Australia

### MODIFIED TUNA LONG-LINING IN SHORE WATERS:

Encouraged by the record bluefin tuna season on the southern New South Wales fishing

grounds, a number of Australian fishermen are turning to modified inshore long-lining to catch yellowfin tuna which normally are available after the bait-and-pole fishing season for bluefin tuna ends in January. The modified long-line method has been used successfully to catch yellowfin tuna in eastern Australian inshore waters for the past two seasons. It differs from the Japanese method of long-lining for bluefin tuna in the Tasman Sea in that the long line is used in much shallower water, the branch lines are at closer intervals, and the main line is shorter. Buoys generally are spaced every three hooks. Branch lines are 2 or 3 fathoms long. Various types of wire trace are used. A few fishermen are using synthetic main lines but those are costly and most continue to use sisal and manila main lines. Synthetic fibers are often used in the branch lines.



Winching gear has been improved considerably since 1963 and most vessels are equipped with efficient horizontal disc-type haulers. The Japanese-type vertical hauler has not yet been introduced in the Australian inshore long-line fishery.

The yellowfin tuna season off New South Wales began in late January 1964. By early March 1964, a total of 200,000 pounds of yellowfin had been taken off southern New South Wales between Ulladulla and Bermagui by vessels operating troll and modified long-line gear. One fisherman operating out of the port of Ulladulla took 4,000 pounds of tuna in 1 day with a long line baited with 200 hooks. Fishermen operating in the Bermagui area with trolling and long-line gear were taking tuna ranging in size from 50 to 80 pounds. The heavier tuna were usually taken on long lines. The yellowfin tuna season off New South Wales

**Australia (Contd.):**

usually lasts until June. (Australian Fisheries Newsletter, April 1964.)

Note: See Commercial Fisheries Review, June 1964 p. 36, April 1964 p. 50.

**British Guiana****SHRIMP INDUSTRY TRENDS, 1963, AND OUTLOOK FOR 1964:**

In British Guiana, the shrimp catch in 1963 was estimated at about 5 million pounds, about the same as in 1962 and considerably above the 4 million pounds caught in 1961. Most of the shrimp catch is exported frozen to the United States.

In early 1964, shrimp vessels operating out of Georgetown, British Guiana, totaled 84 as compared to about 60 in 1962.

A United States firm which operates a number of shrimp vessels in British Guiana plans to expand its freezing capacity during 1964. Observers expect a considerable expansion in the British Guiana shrimp industry, as it is reported to have attracted the interest of a number of United States firms.

Except for shrimp, fishing in British Guiana remains a small enterprise serving the local market. (United States Consul, Georgetown, May 31, 1964.)

**Canada****NEW TUNA CANNERY PLANNED FOR NOVA SCOTIA:**

A new tuna cannery at a cost of \$1.25 million is to be built in Nova Scotia by a British Columbia fishing firm within the next two years. The plant will process both the Pacific and Atlantic tuna catches of a new tuna seiner, the Golden Scarab, which will cost \$1.5 million to build.

The Golden Scarab (168 feet long) is now being built at Luaza, Province of Quebec, and is expected to be completed by November 1964. A second tuna vessel (with 800-ton capacity) will be built and when both vessels are completed, their combined tuna catch will be

handled by the proposed cannery in Nova Scotia. The actual site of the plant has not yet been decided but Dartmouth, Yarmouth, or Liverpool were being considered.

Both of the new tuna seiners will have a long-range capability and will be able to stay out at sea for as long as 100 days. It is planned that they will make a minimum of 4 trips a year, 2 trips to the traditional Pacific tuna fishing grounds off Peru and 2 trips to the warmer waters of the Atlantic Ocean. (National Fisherman, June 1964.)

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**CHINOOK AND SILVER SALMON TAGGING PROGRAM IN BRITISH COLUMBIA:**

A third tagging program designed by the Canadian Department of Fisheries to study the movements and exploitation of British Columbia chinook and silver salmon stocks in the Strait of Georgia area began in late May 1964. A tagging program in the same area conducted during May and June 1963 emphasized the tagging of silver salmon during the "blueback" stage. The results were very successful due in large part to the excellent cooperation of sport and commercial fishermen in returning tags. A second program conducted during December 1963 and January 1964 emphasized the tagging of mature silver salmon, and although tag returns are not yet complete, early indications show promise of an equally successful program.

Chinook salmon are the main objective of the third tagging program and the success of the program will again depend upon the cooperation of fishermen in returning tags with information on the date, method, and location of recovery. A nominal reward of C\$0.50 is offered by the Canadian Department of Fisheries for the return of each tag. (Canadian Department of Fisheries, Vancouver, May 25, 1964.)

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**SALMON TAGGING ON ATLANTIC COAST:**

An extensive program involving the tagging and release of 150,000 Atlantic salmon smolts annually over the next few years was announced in June 1964 by the Canadian Fisheries Minister. The salmon will be reared at fish culture stations of the federal Department of Fisheries in New Brunswick until they are two years old when, as smolts, they will be tagged and released at various points in the Saint John and Miramichi River systems.

## Canada (Contd.):

The purpose of the experiment in fish culture is: (1) to determine more accurately the fate of hatchery-reared salmon after they are released; (2) to find out whether early-run salmon spawn early-run progeny and late-run salmon, late-run progeny; and (3) to provide information on the usefulness of grilse salmon in spawning and propagation. The project will be carried out jointly by the Federal Fish Culture Development Branch and the Fisheries Research Board of Canada.

The Fish Culture Development Branch will carry out its share of the joint program on the Saint John River system. It will involve the rearing, tagging, and release of 50,000 two-year-old smolts from two-sea-year or older early-run salmon.

The Research Board's program on the Miramichi System involves both early-run and late-run salmon. Hatcheries will produce 25,000 early-run and 25,000 late-run two-year-old salmon smolts from maiden two-sea-year parents, and 25,000 early-run and 25,000 late-run two-year-old salmon smolts from grilse parents. The early-run parent salmon are to be taken prior to July 31, and the late-run fish after September 15. (Canadian Department of Fisheries, Ottawa, June 9, 1964.)

\* \* \* \* \*

## MARINE OIL PRODUCTION, UTILIZATION, AND FOREIGN TRADE, 1961-1963:

**Production:** Canadian production of marine oil showed a substantial gain in 1963 due mainly to greater herring oil output in British Columbia which accounted for 82.2 per cent of total production.

Table 1 - Canadian Production of Marine Oils, 1961-1963 and 1956-1960 Average

	1/1963	2/1962	1961	5-Year Avg. 1956-1960
	..... (1,000 Pounds) .....			
Atlantic production <sup>3/</sup>	11,494	10,792	10,650	13,146
British Columbia production (herring oil) <sup>2/</sup>	53,171	41,031	42,863	29,552
Total	64,665	51,823	53,513	42,698

1/Preliminary.

2/Revised.

3/Consists mainly of fish oil and fish-liver oil from groundfish species and seal oil.

4/Consists entirely of herring oil.

Note: Production data converted to pounds using the factor 9.3073 pounds equal 1 imperial gallon.

**Use in Margarine and Shortening:** The domestic margarine industry has become an important user of marine oils. In 1963, marine oil replaced soybean oil as the leading constituent in Canadian margarine. In July and August 1963, marine oils accounted for over 50 percent of the total oils and fats (veg-

Table 2 - Canada's Use of Marine Oils<sup>1/</sup> in Margarine and Shortening Production, 1961-1963 and 1956-1960 Average

Item	Unit	2/1963	3/1962	1961	5-Year Avg.
<b>Margarine Production:</b>					
Quantity of marine oils used	1,000 lbs.	64.6	48.3	31.6	15.8
Percentage of total oils used	Percentage	46.7	31.7	21.3	13.5
<b>Shortening Production:</b>					
Quantity of marine oils used	1,000 lbs.	22.9	21.6	16.9	15.5
Percentage of total oils used	Percentage	12.4	11.9	10.1	9.6

1/Refined-oil basis.

2/Preliminary.

3/Revised.

Table 3 - Canadian Imports of Marine Oils by Country of Origin, 1961-1963

Commodity and Country of Origin	1/ 1963	2/ 1962	2/ 1961
	. . . (1,000 Pounds) . . .		
<b>Cod-Liver Oil:</b>			
United Kingdom . . . . .	526	757	917
Norway . . . . .	37	30	48
South Africa Republic . . . . .	297	-	-
Japan . . . . .	168	84	5
United States . . . . .	4	22	12
Other countries . . . . .	7	-	-
<b>Total cod-liver oil . . . . .</b>	<b>1,039</b>	<b>893</b>	<b>982</b>
<b>Other Fish Oils:</b>			
Iceland . . . . .	11,864	30,060	12,711
Bahama Islands . . . . .	-	-	948
United States . . . . .	12,183	11,868	17,649
Other countries . . . . .	118	196	79
<b>Total other fish oils . . . . .</b>	<b>24,165</b>	<b>42,124</b>	<b>31,387</b>
<b>Whale and Sperm Oil:</b>			
United Kingdom . . . . .	88	172	350
Norway . . . . .	210	133	96
United States . . . . .	350	582	693
<b>Total whale and sperm oil . . . . .</b>	<b>648</b>	<b>887</b>	<b>1,139</b>
<b>Fish Oil, Concentrated:</b>			
United States . . . . .	7	14	68
Other countries . . . . .	-	-	2
<b>Total fish oil, concentrated . . . . .</b>	<b>7</b>	<b>14</b>	<b>70</b>
<b>Fish Oil for Fortifying:</b>			
South Africa Republic . . . . .	83	-	-
Japan . . . . .	83	250	19
United States . . . . .	3	22	15
Other countries . . . . .	-	1	1
<b>Total fish oil for fortifying . . . . .</b>	<b>169</b>	<b>273</b>	<b>35</b>
<b>Total marine oil imports . . . . .</b>	<b>26,028</b>	<b>44,191</b>	<b>33,613</b>
1/ Preliminary.			
2/ Revised.			

## Canada (Contd.):

etable, marine, and animal) used in Canadian margarine. But the use of marine oil in Canadian margarine declined to 38 percent of the total in December 1963 as rising prices reduced the advantage of herring oil over vegetable oil. The prices of British Columbia herring oil delivered at Toronto, Canada, in 1963 were (in Canadian cents per pound): February 8.2; April 8.5; June 9.4; August 10.2; October 10.6; and December 10.7.

**Foreign Trade:** Canadian imports of marine oils were down sharply in 1963 due mainly to smaller shipments of fish oil from Iceland, which in recent years has joined the United States as a leading supplier of marine oils to Canada. Shipments of fish oil from the United States in 1963 were up slightly from the previous year, but down 31.0 percent from those in 1961.

Canadian exports of marine oils in 1963 were more than double those in the previous year, although the major foreign markets for herring oil have not been recovered. (Canadian herring oil exports dropped from over 23 million pounds in 1960 to less than 1 million pounds in 1961.) The gain in exports in 1963 was due mainly to larger shipments of

cod-liver oil to the United States, and greater exports of whale oil to the United Kingdom, Italy, and the Netherlands. Exports of herring oil to the United Kingdom were also up in 1963. (United States Embassy, Ottawa, April 16, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 65, January 1963 p. 80.

\* \* \* \* \*

# CHANGES ANNOUNCED IN FISHING VESSEL ASSISTANCE REGULATIONS:

Changes in the Fishing Vessel Assistance Regulations, which were announced on June 5, 1964, by Canada's Fisheries Minister, give greater encouragement to fishermen in the five Atlantic Seaboard Provinces to acquire more modern and efficient fishing craft. This, the Minister said, is a further step in the development program discussed at the Federal-Provincial conference on fisheries this past January.

The minimum size of vessels eligible for assistance has been lowered to 35 feet overall length, from the previous minimum of 45 feet. The maximum size of 99.9 gross tons is unchanged. Formerly, the rate of assistance was C\$250 a gross ton. That rate has been replaced by two new rates: (a) 25 percent of the cost, approved by the Fisheries Minister, of vessels 35 to 54.9 feet in length overall and, (b) 30 percent of the cost (also approved) of vessels from 55 feet in length overall up to the maximum of 99.9 gross tons. The approved cost will be based on the total cost of each vessel equipped and ready for fishing.

During the first few years of operations under the new regulations, assistance to vessels under 45 feet in length will be limited to approved experimental designs. The Fishermen's Loan Boards in the Provinces of New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland and the Minister of Industry and Commerce in the Province of Quebec will continue the direct administration of the new regulations. Close control over the design and specifications of craft eligible for assistance will be maintained by Federal-Provincial cooperation. This will include consideration of the number of craft to be built each year, their location, and the coordination of their construction with training projects designed to provide skilled manpower for a modern Atlantic fleet.

The new assistance rates apply to all applications filed by fishermen with Provincial

Table 4 - Canadian Exports of Marine Oils by Country of Destination, 1961-1963

Commodity and Country of Destination	1/1963	2/1962	2/1961
	... (1,000 Pounds) ...		
<b>Cod-Liver Oil:</b>			
United Kingdom . . . . .	1,330	1,288	1,338
United States . . . . .	9,136	4,900	5,883
Other countries . . . . .	-	-	3
Total cod-liver oil . . . . .	10,466	6,188	7,224
<b>Other Fish-Liver Oils:</b>			
Total all countries . . . . .	12	34	12
<b>Herring Oil:</b>			
United Kingdom . . . . .	911	-	515
United States . . . . .	36	88	444
Total herring oil . . . . .	947	88	959
<b>Whale Oil:</b>			
United Kingdom . . . . .	1,726	593	-
Italy . . . . .	2,228	-	-
Netherlands . . . . .	896	-	-
El Salvador . . . . .	-	661	-
United States . . . . .	60	-	128
Other countries . . . . .	8	5	-
Total whale oil . . . . .	4,918	1,260	128
<b>Other Marine Oils:</b>			
United States . . . . .	1,302	126	519
Other countries . . . . .	-	20	5
Total other marine oils . . . . .	1,302	146	524
Total marine oil exports . . . . .	17,645	7,716	8,847

1/Preliminary.

2/Revised.

Canada (Contd.):

Loan Boards, and in Quebec with the Minister of Industry and Commerce, after June 30, 1964. (Canadian Department of Fisheries, Ottawa, June 5, 1964.)

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#### NEW RESEARCH STATION ON LAKE HURON:

The Great Lakes Institute of the University of Toronto is establishing a permanent research station on the shore of Lake Huron about 10 miles south of Port Elgin, Ontario. The site is near the nuclear power plant being built at Douglas Point, and two major projects of the new research station are related to the new power facility. All types of fauna in Lake Huron are being examined and rated for natural radioactivity so that comparative tests can be made after the power plant is in operation in 1965 to determine if the natural radioactive level has been altered.

Other studies concern water and wind movements in Lake Huron, including surface and internal wave action and dispersal.

Four instrumented observation towers are being installed at the research station to permit the study of lake conditions to depths exceeding 60 feet. The Great Lakes Institute research vessel Porte Dauphine will carry on offshore studies in the area for part of the summer. (Great Lakes News Letter, Great Lakes Commission, March-April 1964.)

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#### NEW OCEANOGRAPHIC RESEARCH VESSEL COMMISSIONED:

Canada's new \$7 million oceanographic research vessel, the Hudson, was commissioned in February 1964 at Halifax, Nova Scotia. She will be attached to the fleet of the Department of Mines and Technical Surveys at the Bedford Institute of Oceanography at Dartmouth, N.S. Oceanographers on the staff of the Fisheries Research Board of Canada, which has carried out a program of oceanography for many years, will take part in some of the investigations made possible by the addition of this vessel to Canada's scientific research fleet.

One of the most modern oceanographic research vessels afloat, the 294-foot Hudson, of 4,800 tons displacement, has been under construction since early in 1961, and was

overdue for more than a year. Much of the delay was caused by the problems involved in building a ship of such complexity. The vessel was built by a shipyard at Saint John, New Brunswick, in Canada.

The Hudson has a cruising range of 15,000 nautical miles and a speed of over 17 knots. The vessel is considered a complete floating laboratory and is capable of hydrographic and oceanographic work anywhere in the world, but will serve mainly in the Arctic and Atlantic Oceans. Her schedule is already fully booked for 1964, the main tour of duty being a full-scale geophysical investigation of Hudson Bay during July, August, and September. Before heading north in July, she was scheduled to work off the 'tail' of the Grand Banks southeast of Nova Scotia during March and April of this year to obtain information for the production of charts useful to fishermen. (Trade News, February 1964.)

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#### TEN SCHOLARSHIP AWARDS IN FISHERIES FIELDS:

Ten scholarships, valued at \$2,400 each, have been awarded for the 1964/65 academic year by the Fisheries Research Board of Canada. The scholarships were awarded through competition based on scholastic ability to graduate students carrying out research in fields pertinent to fisheries, including biology, zoology, and oceanography. Eight of the ten awards for 1964/65 are renewals, to students who won similar awards last year.

The graduate students will work on their research at four Canadian centers: the University of British Columbia, Vancouver; Dalhousie University, Halifax; the University of Western Ontario, London; and Carleton University, Ottawa. (Fisheries Council of Canada Bulletin, May 1964.)



#### Chile

#### TUNA INDUSTRY EXPANDING:

The Chilean tuna fishing industry is undergoing a revival after a period of relative inactivity. In the spring of 1964, at least 4 vessels based in Chile were known to be fishing for tuna. One of the 3 companies now active in the Chilean tuna fishery has placed orders which should expand its tuna fleet to 10 vessels. In addition, many other vessels in the anchoveta fishery off Chile could be converted to tuna fishing.

The tuna industry of Chile is located at the port of Iquique, in the Province of Tarapaca. In the mid-1950's, the industry

## Chile (Contd.):

worked with an annual catch of 1,000 to 1,500 metric tons of tuna and 2,000 to 8,000 tons of bonito. That period corresponds to the years in which 5 purse-seine vessels of a United States tuna company were working with a Chilean company. Although the 5 purse seiners were left behind when the United States company withdrew from Chile in 1958, tuna fishing in Chile dropped off sharply in the late 1950's when Chile's fish reduction industry shifted to the north.



The new interest of the northern fishing industry was anchoveta. During the period 1959-1962, few vessels went out for tuna because lucrative anchoveta catches were possible within a day's fishing no more than 5 miles off the shoreline.

As part of its program for development of the fisheries of northern Chile, the Corporación de Fomento de Producción (CORFO) organized a new company to establish and operate at Iquique an integrated fisheries enterprise with a cannery, freezing and cold-storage facilities, and a fish meal plant. Plans called for the new company's fish meal plant to open May 28, 1964, and freezing and canning facilities should be in operation by the latter part of 1964. The new company acquired the Santa Rosa as the first vessel of its tuna fleet in late 1962.



Fig. 1 - Small local boats also fish tuna. Fishermen's children wade into surf at Quintay and help beach boats with catches of tuna.

The Santa Rosa, a 170-ton purse-seine vessel equipped with a brine tank, started fishing in January 1963. Its catch was processed (predominantly for export as whole frozen fish) by the company which had formerly worked with the United States tuna vessels. Yellowfin and possibly some albacore tuna were shipped to California, skipjack and bonito to Puerto Rico, and bonito to Europe.

Chilean tuna landings in 1964 should be substantially above those in 1963. In addition to the Santa Rosa, the new company organized by CORFO has purchased 2 new 380-ton vessels (originally built in England for Ghana), which ar-

rived in Chile and began in fishing for tuna in June 1964. The new Chilean company is also having 7 tuna vessels built in a German shipyard.

Two other fishing companies in Chile have also shown an interest in the tuna fishery. One of those companies has re-equipped for tuna fishing at least one of the purse-seiners left in Chile by the U. S. tuna company which withdrew in 1958. The other company (jointly owned by South African and Chilean interests) has diverted a new 170-ton purse seiner to tuna fishing.



Fig. 2 - Fishermen bring their catch of tuna ashore from small boats at Quintay.

The expansion of tuna fishing off northern Chile will vary with the availability of anchoveta to the northern fishing fleet. Another prolonged absence of anchoveta off the northern coast, as occurred in 1963 and again in early 1964, will send many of the 170-ton anchoveta purse-seine vessels out for tuna. It might also lead to the installation of freezing and canning facilities by a number of fishing companies now operating fish meal plants in the area. Some of those compa-

Table 1 - Chilean Landings of Tuna, Bonito, and Swordfish, 1950-1963

Year	Species			
	Añun	Cachurreta	Bonito	Pez-Espada
	(Metric Tons)			
1963	70	57	2,553	94
1962	202	26	2,228	297
1961	21	99	3,586	394
1960	68	-	2,313	456
1959	22	-	2,566	555
1958	172	-	3,823	392
1957	487	39	2,144	357
1956	1,045	240	4,136	386
1955	929	401	7,500	237
1954	831	-	4,405	334
1953	1,116	-	1,974	416
1952	774	-	4,886	570
1951	570	-	3,973	870
1950	412	-	2,927	786

Note: "Añun" generally refers to yellowfin and albacore tuna. "Cachurreta" is skipjack. "Pez-Espada" is the swordfish which is more generally known by the name "albacore." As both albacore tuna and swordfish are captured off Valparaiso, there may have been some confusion in the landing reports on which the statistical data are based.

## Chile (Contd.):

Table 2 - Chilean Landings of Tuna, Bonito, and Skipjack by Months, 1963			
Months	Atun/ (Yellowfin-Albacore)	Bonito	Cachurreta (Skipjack)
	(Metric Tons) . . . . .		
January . .	1.6	164.3	-
February . .	23.8	181.0	19.0
March . . .	37.6	19.5	36.6
April . . .	-	131.2	-
May . . . .	4.7	136.8	-
June . . . .	0.8	138.8	-
July . . . .	0.5	116.9	-
August . .	0.2	99.9	-
September .	-	437.9	-
October . .	0.3	491.4	0.7
November .	0.5	408.7	0.4
December .	-	226.7	0.7
Totals . .	70.0	2,553.1	57.4
1/Mostly of not all yellowfin.			

nies have substantial foreign capital backing. In the past, only one company in northern Chile had freezing and canning facilities capable of handling tuna for export. But by the end of 1964, the new company organized by CORFO will have a modern automatic tuna canning line and blast-and brine-freezing equipment in operation. Those facilities will create a market for tuna that has not existed in north Chile since the withdrawal of the United States tuna firm in 1958.

Yellowfin tuna is taken from 5 to 35 miles off the northern coast of Chile. February through April is the best yellowfin tuna season, according to the captain of the Santa Rosa. Official statistical data indicate that 86 percent of the 1963 Chilean catch of yellowfin tuna was taken in February and March. The bonito catch was spread more evenly over the year in 1963. More intensive fishing might change the picture. For the present and near future, the northern fleet is expected to give preference to anchoveta fishing and turn to tuna in the slack season (normally mid-June to October).

The current vessel preference of anchoveta fishermen in Chile is the 170- to 180-ton purse seiner. Such vessels are capable of fishing for tuna, particularly yellowfin. (United States Embassy, Santiago, May 13, 1964.)



## Costa Rica

FISH AND SHELLFISH LANDINGS,  
1963/64 SEASON:

Landings of fish and shellfish in Costa Rica during the 1963/64 season amounted to 2,288 metric tons--down 5 percent from the previous year. Leading species were shrimp (all varieties) which accounted for 48 percent of the total landings, followed by tuna, and unclassified finfish.

Landings of all species of shrimp were up 17 percent from the previous season and were larger than those for each season since 1959/60 when they were only about one-half the 1963/64 landings. Landings of large white shrimp, however, have declined steadily each season while those for small shrimp increased.

The 1963/64 landings of small white shrimp were at a five-year high and well above the yearly average for the five years under study. Although landings of pink shrimp were 16 percent lower than the previous season, they were well above the yearly average for the five-year period.

Tuna landings during the 1963/64 season were down 23 percent from the previous year. Most of the tuna landed in Costa Rica is purchased by the tuna cannery there from United States fishing vessels.

Costa Rica Landings of Fish and Shellfish, 1963/64 Fishing Season with Comparisons					
Species	1963/64	1962/63	1961/62	1960/61	1959/60
	(Metric Tons) . . . . .				
Fish (Unclass.)	543	659	685	697	695
Shrimp:					
Large white	305	274	385	459	500
Small white	618	557	549	511	121
Pink . . . .	170	202	64	107	-
Tuna . . . .	519	675	554	426	551
Turtle, green	45	23	33	12	21
Spiny lobster	88	27	94	1,420	134
Total . . .	2,288	2,417	2,364	3,632	2,022
Source: Ministry of Agriculture and Livestock, Fish and Wildlife Section.					

Finfish (unclassified) landings were lower in 1963/64, due in part to the low prices offered by the Consejo Nacional de Produccion (National Production Council) which caused fishermen to lose interest in that fishery.

The quantity of spiny lobsters landed in 1963/64 was very small although it was three times greater than the 27 metric tons of the previous season, but down substantially as compared with the 1,420 tons of the 1960/61 season. An issue during the 1963/64 season was the matter of bait for lobster traps. Lobster fishermen on the Atlantic Coast were handicapped because they had to buy substantial quantities of bait from suppliers in Puntarenas on the Pacific Coast at an average price of CR\$0.75 (11 U.S. cents) a pound. Most of the bait purchased there consisted of trash fish which Pacific Coast shrimp fishermen generally discard. Lobster fishermen on the Atlantic Coast of Costa Rica continue to press the Government for suitable regulations which will protect their interests. (United States Embassy, San Jose, May 15, 1964.)





## Denmark

### AUTHORITY SOUGHT FOR RATIFICATION OF WESTERN EUROPEAN FISHERIES CONVENTION AND NEW FISHING LIMITS:

On May 20, 1964, Denmark's Foreign Minister requested ratification by the Danish Parliament of the Fisheries Convention approved March 9, 1964, at the Western European Fisheries Conference in London. The Foreign Minister's proposal pointed out that Denmark will be able to extend its fishing limits in the Kattegat, Skagerrak, and North Sea without affecting the present 12-mile limits in Greenland and the Faroe Islands. It was considered that if Greenland and the Faroe Islands had been included in the Convention area--and for Norway and Iceland to have accepted the Convention--would have been a backward step from their 12-mile limits.

On the same date, the Fisheries Minister also submitted brief legislation relating to Danish fishing limits. The first of that legislation authorizes the Fisheries Minister to establish regulations governing Danish fisheries limits in accordance with the provisions of the London Fisheries Convention of March 9, 1964. The second paragraph states that the legislation does not apply to the Faroe Islands or to Greenland.

Authority to extend Denmark's fishing limits was being sought, according to the Fisheries Minister, because it is in the interest of the fishing industry and the public to do so at the earliest possible time rather than delay until the next session of the Parliament. The authority granted will not be exercised until after discussions with the Parliament and the fishing industry. Also, there are transitional periods before the fully extended limits become effective.

The Fisheries Minister foresees better fishing for Danish inshore fishermen when the limits are extended and better conservation of the fishery resources within the established limits. Since Ireland and the United Kingdom have mentioned a transitional period of 1½ years for countries with historic fishing rights before extending the limits from 3 to 6 miles--and 2½ years where baselines are drawn across bays--Denmark may be required to do the same. West Germany, the Netherlands, and possibly Belgium and France would wish to negotiate with Denmark in regard to their historic fishing off Danish coasts.

Article 10 of the Fisheries Convention provides that nothing in the Convention shall prevent establishment of a special regime in matters of fisheries in a number of instances, including "(c) as between Denmark, Norway, and Sweden," and "(f) in the Skagerrak and Kattegat." Thus, Denmark, Norway, and Sweden may conclude special arrangements in those waters. The Convention of December 31, 1932, between Denmark and Sweden covers some but not all of the boundary waters. There is no similar agreement with Norway. Although Norway is concerned with Skagerrak waters it has not enforced its 12-mile limit in that area. Representatives of Denmark, Norway, and Sweden have held preliminary discussions about fishing limits in the waters between their coasts and may be expected to become more serious about them in the future. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 27, 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 49; April 1964 p. 41; February 1964 p. 39; January 1964 p. 35.

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### WATER PURIFICATION AND PROTEIN EXTRACTION PROCESS MAY BE APPLIED TO FISH REDUCTION INDUSTRY:

A purification and protein extraction process from waste water, which was invented in Denmark, has been used in a potato flour factory in Jutland, Denmark, and is now to be used in the Danish fish meal, dairy, and meat slaughtering industries.

Although earlier experiments were not successful, a small pilot plant at the Jutland potato factory, which has been using the process since November 1963, has so far confirmed blueprint calculations, according to a spokesman of the Chemistry Department, Copenhagen Technological Institute, which assisted the inventor in development of the new process.

The Danish inventor of the process stated that the reason the potato flour factory was chosen for the experiments was because in that type of production large quantities of waste water with relatively little protein content is turned out. Should the process prove effective under those conditions, there would be even more effective under more favorable conditions in other industries such as those for fish meal and dairy products. Experiments in the starch industry are therefore considered completed and the inventor has turned to experiments in other industries.

The project has not yet been developed beyond the pilot-plant stage, but the inventor of the process claims that he is negotiating with some 80 industries all over the world, which have expressed interest in the process. Also, he has been negotiating with three different United States companies concerning representation on the American market. He stated that the purification plant will eventually be constructed by a large internationally known firm. Newspaper reports previously indicated that components for the plant would be supplied by firms in Denmark, Sweden, Norway, and the Netherlands.

According to the inventor, the process consists of a consecutive precipitation with subsequent purification and drying. The precipitation is brought about by the addition to the waste water of sulphuric acid and a special chemical made by the inventor, which at the first stage removes 50 percent of the nitrogen (protein), all starches and all pulps, if any exist. Dur-

## Denmark (Contd.):

ing the second stage of the process, all sugar and 99 percent of the remaining nitrogen are removed. As a result, the BOD (biological oxygen demand) of the waste water is reduced to 1/2 percent of the original and the potassium permanganate content to less than 100 mg./l. The process is automated and requires little manual attention.

While the pilot plant has worked only with the processing of about five metric tons of waste water per hour, the inventor estimates that a regular industrial plant designed for a small potato flour factory should process about 70 tons of water per hour. Such a plant would cost about US\$58,000 to construct. It would turn out about 158 kilograms (348 pounds) of dry matter per hour at a cost of about 6-1/2 cents per kilogram (2.2 pounds). The inventor maintains that the product (according to laboratory tests), if used for fodder purposes, would realize about \$13.00 per 100 kilograms because of its high content of essential amino-acid vitamins. Application of the product in the chemical industry might eventually, he envisions, bring higher yields. The inventor reportedly holds patent rights to the process. (United States Embassy, Copenhagen, May 13, 1964.)



## German Federal Republic

FISH MEAL AND MARINE OIL  
INDUSTRY TRENDS, 1963:

**Fish Meal:** In 1963, there was a decline in the use of fish meal for animal feed in West Germany and a corresponding drop in imports. Peruvian shipments of fish meal to West Germany in 1963 were down 19 percent from the previous year, although Peru was still the dominant supplier. The decline was partly offset by larger shipments from Norway, Iceland, and the South Africa Republic.

Items	1964	1963	1962
	(1,000 Metric Tons)		
<b>Supply:</b>			
Opening stocks, January 1 . . . .	10	8	11
Production . . . . .	85	85	86
Imports . . . . .	320	302	338
<b>Total supply . . . . .</b>	<b>415</b>	<b>395</b>	<b>435</b>
<b>Disposition:</b>			
Exports . . . . .	5	6	4
Domestic disappearance:			
Animal feed . . . . .	400	381	423
Ending stocks, December 31 . . .	10	8	8

<sup>1</sup>Includes small amounts of meat meal.

A moderate increase in the consumption of fish meal is expected in 1964 as a result of an anticipated increase in the demand for feed for laying hens and pigs. Any increase in demand will probably result in higher imports, since domestic production is expected to continue at the level of recent years.

Table 2 - West Germany Imports of Fish Meal, 1962-1963

Country of Origin	1963	1962
	.. (Metric Tons) . . .	
Denmark . . . . .	6,815	7,617
Iceland . . . . .	19,007	16,312
Netherlands . . . . .	2,300	3,833
Norway . . . . .	10,461	4,585
Portugal . . . . .	6,340	5,835
Angola . . . . .	3,693	8,797
Morocco . . . . .	4,898	3,852
South Africa Republic . . . . .	23,375	16,865
Chile . . . . .	3,876	3,672
Peru . . . . .	207,580	255,222
Pakistan . . . . .	2,282	2,138
Other countries . . . . .	4,701	3,131
<b>Total . . . . .</b>	<b>295,328</b>	<b>331,859</b>

Note: Total imports reported above are less than those shown in table 1.

**Marine Oil Foreign Trade:** West German imports of whale oil in 1963 were up 12 percent from those in 1962 due mainly to larger shipments from Japan, because whale oil imports from most other producing countries were down.

Table 3 - West German Foreign Trade in Marine Oil, 1962-1963

Commodity & Country of Origin or Destination	1963	1962
	.. (Metric Tons) . . .	
<b>Imports:</b>		
Whale Oil:		
United Kingdom . . . . .	2,187	5,578
Netherlands . . . . .	5,943	6,990
Norway . . . . .	11,515	13,223
Portugal . . . . .	1,013	329
Peru . . . . .	1,061	758
Japan . . . . .	42,249	29,493
Australia . . . . .	158	455
Other countries . . . . .	2,062	2,219
<b>Total whale oil . . . . .</b>	<b>66,188</b>	<b>59,045</b>
<b>Fish Body Oils:</b>		
Denmark . . . . .	1,696	3,489
Iceland . . . . .	1,410	7,298
Netherlands . . . . .	2,691	1,539
Norway . . . . .	3,880	3,803
Portugal . . . . .	4,072	2,846
Angola . . . . .	3,009	1,989
United States . . . . .	11,371	7,635
Chile . . . . .	2,522	5,531
Peru . . . . .	31,627	29,618
Other countries . . . . .	2,827	1,068
<b>Total fish body oils . . . . .</b>	<b>65,105</b>	<b>64,816</b>
<b>Exports:</b>		
Whale oil . . . . .	441	2,588
Fish body oil . . . . .	17,992	20,754

There was a substantial gain in imports of menhaden oil from the United States in 1963 and imports of fish oil were also up from Peru, Angola, Portugal, and the Netherlands. But the gain was about offset by a decline in fish oil shipments from Denmark, Iceland, and Chile. Total imports of fish oil in 1963 were almost the same as in 1962.

## German Federal Republic (Contd.):

West German exports of marine oil in 1963 consisted mainly of fish body oil. (United States Embassy, Bonn, April 10, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 69.

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### NEW OCEANOGRAPHIC RESEARCH VESSEL LAUNCHED:

Germany's newest and largest oceanographic research vessel, the Meteor, was launched in Bremenhaven on February 8, 1964. The 2,740-ton research vessel is being made ready for participation in the International Indian Ocean Expedition in October 1964. (National Oceanographic Data Center, Newsletter, March 31, 1964.)

Another new research vessel, the Meteor II, was launched in Germany during August 1963 under the joint ownership of the German Hydrographic Institute of Hamburg and the German Research Association of Bad Godesbert.

Note: See Commercial Fisheries Review, February 1964 p. 68.

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### ONE-MAN FIBERGLASS SUBMARINE DEVELOPED:

A one-man submarine made of reinforced fiberglass has been developed by a West German firm. The craft consists of a pressure-tested cabin and two flooding tanks attached to the cabin. It is driven by two 500-watt electric motors which are powered by a battery of 100 amperes per hour. A battery of 286 amperes per hour can also be used.

Power diving and surfacing at any angle are possible with the electric motors. The submarine can also submerge simply by filling both flooding tanks. Compressed air is

carried in two 7-liter bottles to drain the flooding tanks for surfacing. The submarine has a diving range of 50 meters (164 feet). Surface speed is approximately 9 kilometers (5.6 miles) per hour and submerged speed about 6 kilometers (3.7 miles) per hour. With the use of full motor power, the standard battery will last for 2½ hours of operation and the special battery will last for 7 hours. Sufficient oxygen is carried in a 1-liter bottle to remain submerged for 4 hours.

The length of the fiberglass submarine is 3.1 meters (10.2 feet), the largest diameter is 0.7 meter (2.3 feet), the largest width is 1.6 meters (5.2 feet), and the largest height is 1.4 meters (4.6 feet).

Searchlights can be mounted inside or outside the submarine and special instruments can be provided for research purposes.

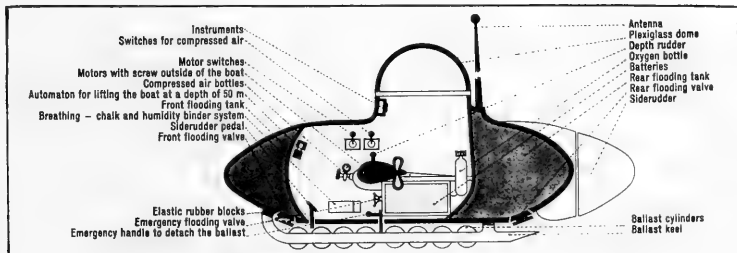


## Ghana

### OUTLOOK AND PLANS FOR FISHING INDUSTRY EXPANSION:

The production goal of the Ghana Fishing Corporation over a 7-year development period is 150,000 metric tons, according to an interview given by an official of that organization in May 1964, as reported in Ghana newspapers. In order to achieve that goal, international waters will be fished and carrier vessels will be used to collect fish stored by the Corporation's trawlers at sea which will be able to stay out fishing for longer periods than at present. By the end of the 7-year period, the Corporation plans that its staff would be increased from the present 600 to 2,000 workers.

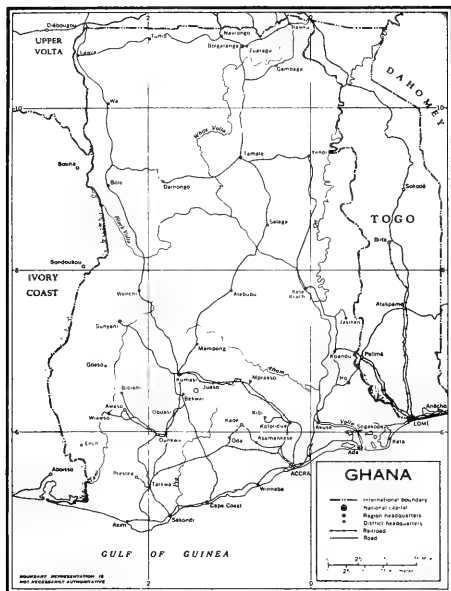
Plans call for the construction at Tema of two modern fish-processing plants by the end



Artist's sketch of one-man fiberglass submarine.

## Ghana (Contd.):

of 1966 capable of turning out canned, smoked, and salted fish. The daily capacity of the canning plant will be 60,000 cans of sardines. The complex of fish-processing plants at Tema, designed by Soviet experts, is expected to process close to 12,500 tons of fish a year, chiefly sardines, and produce up to 30 million cans of fish, almost 1,300 tons of smoked fish, and up to 900 tons of fish meal and oil. The various plants will also serve as a center for training Ghanaian fishing specialists.



The Corporation's marketing and distribution plans call for the construction of cold-storage warehouses along the coast at Ema and Takoradi, and smaller ones in the rural areas. The cold-storage plants would be supported by a fleet of refrigerated trucks.

According to the Corporation spokesman, that organization as a State enterprise, plans to eliminate the middle man in the sale of fish. This would be achieved mostly by the daily sale of fish to the fishing cooperatives. The Government will also sponsor a program to send Ghanaians overseas for training in

scientific fishing, vessel engineering and mechanics, and other specialized training. (Fishery Attache, Abidjan, May 22, 1964, and Ghana Newspaper Reports.)

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## FISHERY LANDINGS UP SHARPLY IN 1963:

Ghana's marine fishery landings in 1963 amounted to 89,304 metric tons, an increase of 42.7 percent from the previous year's landings and nearly three times greater than the 1961 landings. A good part of the gain in 1963 was due to increased landings by foreign vessels (mostly Japanese and Soviet) on charter to the government-controlled Ghana Fishing Corporation.

Table 1 - Ghana's Marine Fishery Landings By Types of Vessel, 1963 with Comparisons

Type of Fishery	1963	1962	1961
... (Metric Tons) ...			
<b>Canoe Fisheries:</b>			
Herring	6,964	16,507	15,141
Line	2,401	2,005	859
Other	26,340	14,303	11,470
Total canoe landings	35,705	32,815	27,470
<b>Motor Fishing Vessels:</b>			
Trawl	9,431	1,084	1,110
Line	477	546	353
Herring	1,974	2,110	1,481
Tuna	6,868	5,108	3,564
Other	1,494	406	-
Total motor fishing vessel landings	20,244	9,254	6,508
<b>Fishery Contracts:</b>			
From Japanese Vessels	-	167	-
From U.S.S.R. Vessels	-	20,352	-
Ghana Fishing Corporation	14,094	-	-
Foreign Corporations	16,847	-	-
Local Corporations	2,412	-	-
Total	33,355	20,519	-
Grand total	89,304	62,588	33,978

Source: Ghana Ministry of Agriculture, Fisheries Inspectorate Unit.

Table 2 - Catch Composition of Ghana's Fishery Landings By Species and Type Vessel, 1963 with Comparisons

Species by Type of Vessel	1963	1962	1961
... (Metric Tons) ...			
<b>Herring Landings:</b>			
Canoe	6,964	16,507	15,141
Motor vessels	1,974	2,110	1,481
Total herring landings	8,938	18,617	16,622
<b>Other Species:</b>			
Canoe	28,741	16,308	12,329
Motor vessels	18,269	7,143	5,028
Fish contracts	33,356	20,520	-
Total other species	80,366	43,971	17,357
Tuna transhipped out of Ghana	5,665	4,643	3,564
Used for domestic consumption	83,639	57,945	30,414

Source: Ghana Ministry of Agriculture, Fisheries Inspectorate Unit.

Although herring landings by canoes were down sharply from the 16,500 tons landed in

## Ghana (Contd.):

1962, there were substantial increases in landings of other species. As a result, total landings by canoes were up 8.8 percent from a year earlier and those by motorized vessels increased 119 percent from 1962. The 1963 tuna landings of nearly 7,000 tons were up 34 percent from the previous year, of which 5,665 tons were transshipped out of Ghana.

With the recent introduction of underwater light fishing for herring at night, prospects are good for a considerably better 1964 herring season. Also, with additional deliveries of the total of 44 trawlers and purse-seiners on order from four countries (Japan, U.S.S.R., Norway, and the United Kingdom) scheduled for 1964, the prospects for an overall increase in Ghana fisheries production in 1964 are bright. (Fishery Attache, United States Embassy, Abidjan, May 22, 1964.)

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#### FIRST NORWEGIAN-BUILT STERN TRAWLER LAUNCHED:

The trawler *Shama*, the first of 7 trawlers being built in Norway for the government-controlled Ghana Fishing Corporation in Ghana, was launched in April 1964. The Norwegian shipyard is to build all 7 of the trawlers and will also send Norwegian experts to Ghana with the vessels. The experts will be in command of the vessels for 18 months.

The 7 vessels will all be stern trawlers with an overall length of 231 feet 7 inches, and will be powered by Diesel engines generating 1,960 b.hp., coupled to reversible propellers.

Fish will be stored in two insulated cargo holds on the main deck of the vessels and will be frozen to -20° F. in the tropical climate. Hydraulic deck machinery and electrically operated transport belts on the vessels will facilitate handling of the fish at sea and in port.

The Ghana Fishing Corporation has ordered 40 trawlers from Norway, the United Kingdom, and Japan. Norway has also agreed to train Ghanaian fishermen. (The South African Shipping News and Fishing Industry Review, April 1964.)



## Greece

#### FREEZER-TRAWLER LANDINGS, JANUARY-MARCH 1964:

The Greek fleet of refrigerated trawlers and carrier vessels operating in the Atlantic landed 1,180 metric tons of frozen fish in Greek ports in March 1964, down 19 percent from landings of 1,458 tons in the same month of the previous year.



Greek frozen fish landings during January-March 1964 amounted to 4,422 tons, compared with landings of 4,392 tons in the same period of 1963 and 3,760 tons in the first quarter of 1962. (*Alieia*, April 1964.)



## Honduras

#### FISHERIES TRENDS, FIRST QUARTER 1964:

A fishery firm operating in Honduras shipped 500,000 pounds of shrimp to the United States during the 7-months' season that ended in the first quarter of 1964. The firm employs 14 fishing vessels.

A fishing cooperative at the port of San Lorenzo in southern Honduras has built a cold-storage warehouse with the aid of the Corporation for American Relief Everywhere (CARE) and other groups. The cooperative now delivers fresh fish regularly to Tegucigalpa in a truck donated through CARE by the

## Honduras (Contd.):



employees of a United States insurance firm. (United States Embassy, Tegucigalpa, May 20, 1964.)



## Iran

FISHERY TRENDS AND DEVELOPMENTS:

A \$15 million construction loan by the United States to Iran for the development of the Port of Bandar Abbas (in the southeast part of the Persian Gulf) is expected to give impetus to Iran's commercial fishing industry in the south, which presently is very limited.

There is little commercial fishing now being done by Iran in the Persian Gulf despite a reported abundance of fish and shrimp. There is a fish cannery in Bandar Abbas operated by the Iranian National Fishing Company (Shilat), but it produced only about 300,000 cans (4-ounce) of fish in each of the past few years as against its potential capacity of several million cans a year. At times the plant is completely shut down because of a lack of fish for processing. There are now two foreign commercial fishing firms operating in the Persian Gulf—one from Kuwait and the other from Pakistan. Each of those firms has a well-equipped refrigerated mothership and a fleet of smaller catcher vessels.

The local Governor of the Bandar Abbas area said he was confident that the limited and intermittent commercial fishing done by a fishing company in the southern part of Iran would be resumed full time in the near future and that although that company was owned by the Iranian Government, it would be independent of Shilat.

Officers of the United States Consulate at Isfahan reported that two persons with whom they spoke in Bandar Abbas expressed interest in either a joint venture with a United States fishing firm, or in acting as export agents for Iranian Persian Gulf fishery products for export to the United States. Several such fishery joint ventures have for various reasons not been very successful in the past. (United States Consulate, Isfahan, March 31, 1964.)

Note: See *Commercial Fisheries Review*, January 1964 p. 53; October 1963 p. 52, July 1963 p. 79.



## Ireland

SCALLOP GROUNDS DISCOVERED:

Scallops have been found in commercial quantities off the southeast coast of Ireland in St. George's Channel. The Irish Government sponsored the scallop investigation following reports that scallops had been taken

## Ireland (Contd.):

in trawls about 11 miles from Dunmore East, which is the center of a herring fishery. The crew of a 50-foot commercial fishing vessel has been instructed in the dredging method of taking scallops and those involved in the project are confident that a commercial scallop fishery will develop. (Fish Trades Gazette, April 25, 1964.)

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### UNITED STATES TEAM BEGINS FISHERIES SURVEY:

Four specialists from the United States Bureau of Commercial Fisheries arrived in Ireland in late April 1964 to implement the United States-Irish cooperative fishery research project. A representative of the United States team said the group would study the development plans of the Irish Sea Fisheries Board, and assist in the establishment of a research-development organization.

The Irish fishing industry is generally limited to inshore operations. After a 2-months survey of Irish operations, the United States team may be able to offer suggestions concerning fishing, processing, and marketing, since the species exploited by the Irish industry are similar to some of those caught by United States fishermen. (Fish Trades Gazette, April 25, 1964.)



## Japan

### CANNED TUNA IN BRINE SALE TO UNITED STATES:

The Japanese tuna packers and exporters (who were negotiating export prices) have settled on a promotional allowance of US\$1 a case (48 7-oz. cans) for the 200,000 cases of whitewater tuna in brine for export to the United States which were to be offered for sale on May 19, 1964. The exporters had hoped to offer for sale 170,000 cases of whitewater tuna in brine and 100,000 cases of light meat tuna in brine for export to the United States, but their request was rejected by the packers. However, the packers granted the full promotional allowance requested by the exporters, which brought the price of the solid white pack down to \$12.60 a case f.o.b. Japan.

Negotiations were still in progress over the matter of promotional allowances for the solid light meat tuna in brine pack and lower grade packs. (Suisancho Nippo, May 16 & 18, 1964.)

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### EXPORTS OF CANNED TUNA IN BRINE TO U. S. BY DESTINATION:

New York City and Boston again led all other United States cities as the chief markets for Japanese canned tuna in brine, according

Japanese Exports of Canned Tuna in Brine to U. S. by Destination Points, 1962-1963				
Destination	1963		1962	
	No. Cases	Percent of Total	No. Cases	Percent of Total
Total . . . . .	2,234,434	100	2,110,137	100
New York . . . .	612,571	27.42	564,523	26.75
Boston . . . . .	524,834	23.49	492,920	23.36
Baltimore . . . .	188,618	8.44	142,959	6.77
Chicago . . . . .	175,735	7.86	174,785	8.28
Philadelphia . . .	120,631	5.40	129,785	6.15
Los Angeles . . .	96,250	4.31	85,716	4.06
San Francisco . .	96,192	4.30	87,611	4.15
New Orleans . . .	58,822	2.63	44,877	2.13
Seattle . . . . .	54,138	2.42	41,413	1.96
Houston . . . . .	35,902	1.61	32,238	1.53
Detroit . . . . .	31,176	1.40	33,307	1.58
Others . . . . .	239,565	10.72	280,003	13.28

to a survey conducted by the Japan Canned Foods Exporters Association. (Suisan Tsushin, May 18, 1964.)

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### STANDARD PRICES ESTABLISHED FOR CANNED WHITE MEAT TUNA IN BRINE:

Standard prices for Japanese canned white meat tuna in brine packed for export to the United States have been established by the Ja-

Japanese Canned Whitemeat Tuna in Brine Prices <sup>1/</sup> , 1964					
Pack	Can and Case Size	Price Per Case			
		Yokohama		Shimizu	
		Yen	US\$	Yen	US\$
Fancy A	13-oz. 24's	2,977	8.27	2,984	8.29
" B	" "	2,907	8.07	2,914	8.09
" A	7-oz. 48's	3,202	8.89	3,211	8.92
" B	" "	3,132	8.70	3,141	8.72
" A	3.5-oz. 48's	1,863	5.17	1,870	5.19
" B	" "	1,823	5.06	1,830	5.08
" A	66-oz. 6's	3,427	9.52	3,434	9.54
" B	" "	3,357	9.32	3,364	9.34
" A Flake	6.5-oz. 48's	2,332	6.48	2,341	6.50

<sup>1/</sup>Prices shown represent packers' prices to the Japan Canned Tuna Sales Company.

pan Canned Tuna Packers Association at a general meeting in mid-May 1964. (Suisancho Nippo, May 21, 1964.)

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Japan (Contd.):

#### EXPORTS OF CANNED TUNA SPECIALTY ITEMS, 1963:

Japanese exports of specialty canned tuna products (other than those packed in brine and in oil) totaled 455,986 cases in fiscal year 1963 (April 1963-March 1964), according to data compiled by the Japan Canned Tuna Packers Association. West Germany was the biggest market, accounting for 66 percent of exports (301,201 cases), followed by the Netherlands with 15 percent (66,594 cases), Belgium 8 percent (35,188 cases), Canada 4 percent (20,025 cases), and Great Britain 2 percent (10,250 cases). Twenty-six other countries accounted for the remaining 5 percent (22,728 cases). (Suisancho Nippo, May 25, 1964.)

Note: The press report gave the exports as 438,896 cases. Tabulation of data by countries of destination showed exports totaled 455,986 cases.

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#### CANNED TUNA MARKET TRENDS:

The Japan Tuna Packers Association, at a directors meeting held on June 3, 1964, at Tokyo, decided to reduce by 300,000 cases the quantity of canned tuna in brine that the Association had planned to consign to the Canned Tuna Sales Company (for export to the United States) for the third quarter (January 1-March 31, 1965), from 500,000 cases to 200,000 cases. At the same time, the Association adopted the following measures:

1. Change the consignment ratio of lightmeat to whitemeat. Henceforth, consignment to the Sales Company of lightmeat tuna will be held below the 50-percent level, and of whitemeat above the 50-percent level. Previously, light meat was limited to over 20 percent but under 50 percent of the total consignment.

2. Consignments to the Sales Company to consist of the following ratio of can sizes: 13-oz. pack--20 percent (same as before); 7-oz. pack--35 percent (previously 45 percent); 66-oz. pack--45 percent (previously 35 percent). However, packers may be exempted from this ruling by permission of the Association's Director.

3. Establish a committee (8 members) to develop sales policy to overcome stagnant sales.

The quantity to be consigned to the Canned Tuna Sales Company for the third quarter of

1965 was reduced as a result of declining sales of Japanese canned tuna in brine in the United States. For the business year beginning December 1963, a total of 880,000 cases has been offered for sale by the Sales Company. However, as of May 31, only 450,000 cases of that amount have been shipped to the United States. (Suisan Tsushin, June 4; Nihon Suisan Shimbun, May 22, 1964.)

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#### JAPAN TUNA PACKERS ASSOCIATION MEMBERS PACK BULK OF CANNED TUNA:

Data compiled by the Japan Tuna Packers Association indicate that in fiscal year 1963 (April 1963-March 1964) its 78 member firms packed a total of 3,811,597 cases of canned tuna in oil and brine for export, and that 21 nonmember firms packed a total of 100,689 cases of tuna in brine for export to the United States.

Production of the ten largest packers totaled 1,527,274 cases, equal to 40 percent of the total year's pack produced by the firms affiliated with the Association. Of the remaining 68 firms, 6 companies packed from 75,000-100,000 cases (average 84,367 cases), 11 companies packed from 50,000-75,000 cases (average 64,908 cases), 17 companies from 25,000-50,000 cases (average 36,500 cases), and 34 companies less than 25,000 cases (average 12,552 cases).

The 21 non-Association members packed an average of 4,795 cases during the fiscal year. (Suisancho Nippo, May 22-25, 1964.)

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#### EXPORT TARGETS FOR FISHERY AND AQUATIC PRODUCTS, FISCAL YEAR 1964:

The total value of Japan's proposed export target for fishery and aquatic products is US\$284.9 million. Canned fishery products account for 44.0 percent of the total value, frozen and fresh products 35.5 percent, cultured pearls 18 percent, salted and dried products 2.0 percent, and agar-agar 0.4 percent. The 1964 export target value represents an increase of 12.3 percent over the actual exports in 1963 and 9.8 above the value of exports in 1962.

The proposed export target of canned fishery products in 1964 of 11.2 million cases, valued at \$125.4 million, is an increase in quantity of 2.8 percent and a decrease in value of 0.1 percent as compared with exports of similar products in 1963. Comparing proposed exports in 1964 with those of 1963 on an item to item basis, the following changes in quantity and value are noted: tuna up 8.0 percent in quantity and 8.9 percent in value; saury up 8.1 percent in quantity and 11.5 percent in value; horse-mackerel up 39.5 percent in quantity and 31.5 percent in value; salmon down 6.2 percent in quantity and 6.5 percent in value; crab meat down 7.0 percent in quantity and 7.1 percent in value; other fish and shellfish down 4.2 percent in quantity and 4.3 percent in value.



## Japan (Contd.):

Japanese Export Targets for Fishery and Aquatic Products, Fiscal Year 1964 With Comparisons						
Product	FY 1964		FY 1963		FY 1963	
	Export Target Qty.	Value/ Cases	Export Target Qty.	Value/ Cases	Actual Exports Qty.	Value/ Cases
<b>Canned Fish:</b>						
Tuna	4,450	37,513	4,250	34,612	4,119	34,456
Salmon	1,395	43,962	1,710	51,124	1,487	47,003
Crab meat	438	11,004	440	11,077	471	11,841
Sardines	100	780	500	3,625	180	1,363
Saury	1,650	10,680	1,370	7,773	1,527	9,582
Horse-mackerel	600	3,948	560	3,398	430	3,003
Other fish and shellfish	2,590	17,521	1,855	14,527	2,702	18,301
<b>Total canned</b>	<b>11,223</b>	<b>125,408</b>	<b>10,685</b>	<b>126,436</b>	<b>10,916</b>	<b>125,549</b>
<b>Frozen Fish &amp; Shellfish:</b>						
Tuna	177,804	61,627	174,400	57,184	136,872	50,277
Swordfish	6,800	4,320	7,700	5,700	5,927	4,237
Salmon	1,500	1,940	2,000	2,000	975	1,260
Rainbow trout	1,500	1,415	2,000	1,080	1,373	1,295
Shrimp	1,500	2,174	2,000	3,200	1,164	1,687
Other	55,000	13,530	45,000	14,250	34,551	8,507
<b>Total frozen</b>	<b>244,104</b>	<b>85,006</b>	<b>232,300</b>	<b>83,414</b>	<b>180,662</b>	<b>67,283</b>
<b>Fresh fishery products</b>	<b>55,500</b>	<b>16,095</b>	<b>2</b>	<b>10,000</b>	<b>20,157</b>	<b>5,856</b>
<b>Other Products:</b>						
Salted and dried	4,200	5,800	5,440	6,000	4,301	5,795
Agar-agar	350	1,260	610	1,800	335	1,200
Pearls (cultured)	19,000	51,300	15,500	41,200	18,040	47,938
<b>Total value of all products</b>		<b>284,869</b>		<b>268,950</b>		<b>253,621</b>

1/Based on f.o.b. prices in Japan.

2/Not given.

3/In Kana: One Kana equals 8.267 pounds.

Source: Export approval statistics and customs clearances.

The proposed exports of frozen fishery products for 1964 total 244,104 metric tons valued at \$85 million. Compared with the 1963 exports, they are higher by 34.9 percent in quantity and 26.3 percent in value. Notable in the proposed exports of frozen fishery products for 1964 is the sharp increase for tuna—greater by 29.8 percent in quantity and 22.6 percent in value than the previous year's exports.

Under the proposed export target for 1964, shipments of cultured pearls and agar-agar will be maintained at about the 1963 level. The proposed exports of fresh fishery products in 1964 show the sharpest percentage increase over the previous year's exports—75.3 percent more in quantity and 174.8 percent more in value. (Fisheries Attache, United States Embassy, Tokyo, May 11, 1964.)

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SUMMER ALBACORE FISHERY  
AND EXPORT TRENDS:

Some 5,000 metric tons of albacore tuna were reported to have been landed as of early June 1964 in Japan since the beginning of the summer albacore fishery. Of that amount, 1,500 tons were estimated to have been bought by Japanese traders engaged in the frozen tuna export trade.

As of early June, the Japanese traders are reported to have signed contracts with United States tuna packing firms amounting to 2,000 to 2,500 tons of albacore. Those traders will need to purchase an additional 500-1,000 tons of albacore to meet their United States com-

mitments, but are expected to be able to do so readily due to the large quantity of albacore landed during June (ranging from 300-500 tons a day) and also due to slow buying on the part of Japanese tuna packers.

The export price of frozen albacore has declined steadily since the beginning of the summer fishery. From a high of US\$400 a short ton, the c.i.f. price has dropped to \$360 a ton, and offers of \$350 a ton are now being made. (Suisan Tsushin, June 9, 1964.)

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TUNA BASES AT PENANG  
OPERATE AT A LOSS:

The Japanese fisheries company which operates the tuna bases at Penang, Malaysia, and Port Luis, Mauritius Island, and the tuna cannery at Penang, held its sixth annual stockholders meeting at Tokyo on May 30, 1964. For the business year April 1963-March 1964, that firm is reported to have lost 70.2 million yen (US\$195,000). That sum is in addition to the losses carried over from the previous business year, which totaled 34.7 million yen (US\$96,389).

The operational deficit of that firm was attributed to the difficulty it faced in attracting sufficient tuna vessels to operate out of its bases, thereby preventing the economic utilization of its bases and plant facilities. (Suisan Tsushin, June 1, 1964.)

\* \* \* \* \*

TUNA FISHING TRENDS IN  
SOUTH PACIFIC:

Japanese tuna fishing about 200 miles north of the New Hebrides Islands, South Pacific, improved greatly toward the end of May 1964. The six Japanese tuna vessels operating out of the tuna base at Espiritu Santo, New Hebrides Islands, had concentrated in that area and were averaging 3 metric tons of tuna per vessel per day as compared to 1.8 tons per day prior to May 20.

The tuna mothership Yuyo Maru (5,040 gross tons), accompanied by 55 catcher vessels, departed Tokyo on May 27 for the South Pacific tuna fishing grounds off the Fiji Islands. Catch target of the mothership, which was scheduled to remain on the fishing grounds until August 25, was 5,400 metric tons of tuna, spearfish, and shark.

The Yuyo Maru, which commenced fishing operations on June 6, was reported to be catch-

## Japan (Contd.):

ing an average of about 4 metric tons of tuna a day per catcher vessel. The highest catch registered by a catcher vessel of that fleet is 9 tons a day.

The Nojima Maru (8,800 gross tons) tuna mothership fleet, which started fishing operations on May 26 in the vicinity of Tahiti, was reported to be averaging close to 3 tons of tuna a day.

The firm operating the Nojima Maru plans to transship to the United States about 3,900 metric tons of tuna caught by that mothership. That firm has not as yet selected a port of transshipment. The port of Papeete, Tahiti, reportedly is not suitable and an island near Tahiti is expected to be selected as the transshipment port. The carrier vessels Tsukishima Maru and Hokko Maru will transport the tuna to the United States. The Tsukishima Maru was to have left Kobe on June 3. The Hokko Maru was scheduled to leave Japan on July 7. (Suisancho Nippo, May 27 and 29, 1964.)

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## TUNA FISHING TRENDS IN ATLANTIC OCEAN:

Some 150 Japanese tuna vessels operating in the Atlantic Ocean are reported to be catching large quantities of bluefin and big-eyed tuna. The majority of the bluefin is said to range in size from 400 to 800 pounds. The preponderance of those two species in the tuna catch is said to have created a marketing problem for the Japanese trading firms. This is because tuna importing countries such as Italy prefer yellowfin and are willing to accept mixed species of tuna provided the shipments consist mainly of yellowfin. The Atlantic tuna catches are said to be presently running 30 percent yellowfin to 70 percent bluefin and big-eyed. (Suisan Tsushin, June 6, 1964.)

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## FIRM TO OPERATE PURSE-SEINE FLEET IN ATLANTIC:

A Japanese fishing firm's application to engage in purse-seine fishing off the coast of West Africa, using Ghana as a base, has been approved by the Fisheries Agency. The firm plans to conduct a mothership-type operation, employing one mothership and two 90-ton

purse-seine vessels. Assignment to that fleet of 5 pole-and-line vessels operating out of Ghana is also being contemplated.

Fishing operations (primarily for tuna and mackerel) are expected to begin in August. The Japanese firm is planning on employing the 1,700-ton freezer ship Chichibu Maru No. 2 as the mothership. (Suisancho Nippo, May 15 & 18, 1964.)

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## HALIBUT MOTHERSHIP RETURNS:

The Japanese 700-ton mothership Fuji Maru No. 3, specially chartered to fish for halibut in Area 3B North Triangle (Eastern Bering Sea), was scheduled to arrive in Tokyo on May 23, 1964. Reportedly, that mothership caught a total of 350 metric tons of fish, consisting of 100 tons of halibut and black cod, and the remainder mainly rockfish. (Suisan Tsushin, May 22, 1964.)

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## CANNED PINK SALMON EXPORT PRICES:

The Japan Land Salmon Packers Association, at a directors' meeting held in Hokkaido in early June, according to Minato Shimbun, June 5, 1964, has established the following standard export (f.o.b.) prices for canned pink salmon.

Product	Price Per Case
	US\$
<u>Canned Pink Salmon:</u>	
Fancy 48 cans/cs. (8-oz.)	10.60
" 96 cans/cs. (8-oz.)	12.65
Standard 48 cans/cs. (8-oz.)	9.60
" 96 cans/cs. (4-oz.)	11.65

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## JAPANESE NORTH PACIFIC MOTHERSHIP SALMON PRICES:

The Japan Federation of Salmon Fishermen's Associations (NIKKIREN) and the salmon mothership companies have reached agreement on the following ex-vessel prices for fresh whole salmon delivered by the catcher vessels to the motherships:

Species	1964 Price		1963 Price	
	Yen/kg.	U.S. Cents/lb.	Yen/kg.	U.S. Cents/lb.
Red	213	26.8	203	25.6
Chum	115.5	14.6	110	13.9
Pink	93	11.7	88.5	11.2
Silver	126	15.9	120	15.2
King	126	15.9	120	15.2

The 1964 salmon prices represent a flat 5 percent increase over 1963. The price negotiations were concluded on May 15, 1964, the day that the 11 salmon motherships and

## Japan (Contd.):

369 catcher vessels were scheduled to depart for the fishing grounds, following the issuance of a directive issued by the Fisheries Agency (on the afternoon of May 15) calling on the NIKKEIREN and the mothership companies to make every effort to reach a settlement in good faith so that the fleet could depart as scheduled; otherwise, any delay in the fleet departure may well affect the departure date of the fleet in 1965.

The NIKKEIREN had called a mass meeting on the morning of the 15th of the 2,000-odd vessel owners and fishermen and threatened to stop the departure of the salmon fleet. The fleet departed shortly after the price settlement was reached, but about 10 hours later than scheduled. (Suisan Nippo, May 16; Suisan Tsushin, May 18, 1964.)

**Editor's note:** We have had several inquiries concerning the seemingly high prices for salmon paid to the Japanese fishermen. We have checked our sources carefully and believe the published prices are reliable. Despite the high cost of the raw product to the Japanese packers, we believe they are able to maintain their competitive position on the world canned salmon market for the following reasons:

1. **Labor cost:** The labor cost is very low. For example, our understanding is that the workers on the Japanese motherships receive an average salary of about \$145 a month. At shore-based plants in Hokkaido, the cannery workers, mostly women, are provided, in addition to room and board, a monthly salary ranging from \$20-30 a month.

2. **Meat recovery:** Recovery of meat per pound of fish is believed to be higher in Japan than in the United States. For example, meat attached to the head section is recovered manually by the Japanese and canned as "tid-bits."

3. **Utilization of byproducts:** Japanese packers pack salmon caviar incidentally to their canning operations. The value of this product, which has a special market in Japan, is reported to be substantial. For example, in 1963 processed pink salmon roe (caviar) is said to have sold for \$4.00 a pound on the wholesale market. First grade roe of other species sold for about \$20-25 a pound. The fact that Japan has arranged to obtain salmon roe from United States canneries further attests to the economic value of that product. Another byproduct is salmon carcasses. For example, on the motherships, scraps remaining from the canning operations are processed for later conversion into fertilizer.

4. **Other products:** Large quantities of pink and chum salmon are salted. The return to the packer on the salted product compares favorably to that for the canned product. Smoked salmon is becoming a popular item in Japan. Smoked red salmon has a ready market in West Germany and the United Kingdom. The return to the producer on this specialty item is reported good.

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### SALMON CATCH BY MOTHERSHIP FLEETS:

The salmon catch for the first ten days of the Japanese mothership fleets operating in the northern waters was reported to be running 65 percent reds, 32-33 percent chums, and 2-3 percent pinks. (Suisan Tsushin, June 2, 1964.)

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### HOKKAIDO PACKERS BEGIN PACKING PINK SALMON:

Japanese salmon packers in Hokkaido are reported to have started packing pink salmon quarters, paying about 220 yen a kilogram (US\$0.277 a lb.) for the fresh fish. Reportedly, at that price they are barely able to show a profit. The high cost of the raw product is attributed to the earliness of the fishing season and scarcity of fish.

The pink salmon fishery off eastern Hokkaido was expected to peak toward mid-June at which time the Hokkaido packers planned to start putting up pink halves. Reportedly, to be able to pack that style at a profit the excess pink salmon price will have to come down to the 180-190 yen a kilogram (US\$0.206-0.217 a lb.) level. (Suisan Tsushin, June 2, 1964.)

**Editor's note:** Salmon caught by the Japanese fishing vessels operating in the North Pacific east of the Kurile Islands and Hokkaido are usually sold by auction on the open market. They command higher prices than those prevailing in the salmon mothership fishery.

In the case of the mothership fishery, prices are negotiated between the fishermen and mothership companies for the entire salmon season. The 1964 pink price to the fishermen engaged in the mothership fishery is \$0.117 per pound.

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### SALMON FISHERMEN REQUEST TUNA FISHING LICENSES:

Japanese salmon fishermen engaged in the mothership-type salmon fishery have begun a concerted national effort to seek six-months tuna fishing licenses for 114 of their salmon vessels (80- to 90-ton), claiming that they need the licenses to ensure their livelihood, which they claim is now wholly dependent on the income derived from one fishery. They are being supported in their demands by the Northern Water Mothership Council (composed of the large companies operating motherships in the northern waters), prefectural Diet representatives, and the Governors of the 13 prefectures in northern Japan, and are taking their case directly to the Minister of Agriculture and Forestry and to the Diet.

The National Federation of Tuna Fishermen's Cooperative Association (NIKKEIREN),

## Japan (Contd.):

pointing to recent trends in the tuna fishery, claims that the salmon fishermen's demand violates the recently enacted Revised Fisheries Law. The NIKKEIREN plans a strong opposition to the demand of the salmon fishermen and intends to carry on their fight on a political level also. (Minato Shimbun, June 6; Shin Suisan Shimbun, June 8, 1964.)

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ATLANTIC TRAWL LANDINGS, 1963:

The 34 Japanese trawlers operating in the Atlantic Ocean off the coast of Africa landed a total of 91,984 metric tons of fish in 1963, according to preliminary data released by Japan's Fisheries Statistics Section, Ministry of Agriculture and Forestry. This is an increase of 44,000 tons over the 1962 catch made by 32 trawlers.

The 1963 catch consisted of 39,105 tons of sea bream, 20,298 tons of squid, 6,999 tons of octopus, 6,504 tons of mackerel, 6,631 tons of cod, and 12,447 tons of miscellaneous species, with a total value of 11.2 billion yen (US\$31.1 million). Of the total catch, nearly half (close to 45,000 tons) was exported to Europe, Africa, and the Middle Eastern and Near Eastern countries. The exports, consisting mainly of lower-priced fish, were valued at 2,640 million yen (US\$7.3 million).

Reportedly, the Japanese Atlantic trawl fleet in 1965 is expected to total 52 trawlers. In 1960 there were 5 trawlers engaged in the fishery off West Africa, in 1961 there were 15 trawlers, and in 1962 the number was 32 trawlers. (Suisancho Nippo, June 5, 1964.)

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JOINT JAPANESE-CANADIAN FISHING ENTERPRISE IN CANADA PROPOSED:

One of Japan's largest fishing companies has submitted an application to the Ministry of International Trade and Industry to export three 300-ton trawlers to Canada as part of its investment in the company that the firm plans to establish in Newfoundland jointly with a Canadian fisheries company. Should the application be approved, the Japanese firm plans to transfer to Canada the two 300-ton trawlers (Eiyo Maru and Chuyo Maru No. 16) presently fishing in the North Atlantic with the 3,700-ton stern trawler Tenyo Maru No. 3.

The Canadian firm is reported to own processing and freezing facilities capable of handling the catch of ten 300-ton trawlers. The company employs 500 people. (Suisancho Nippo, May 25, 1964.)

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KING CRAB FISHING IN BRISTOL BAY IMPROVES

The two Japanese king crab factoryships (Tokei Maru, 5,835 gross tons; and Dainichi Maru, 5,859 gross tons) operating in the Eastern Bering Sea are reported to be doing well after a relatively slow start. They were averaging about 11 crabs a shackle. (Suisan Tsushin, May 18, 1964.)

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KING CRAB CANNED PACK AND EXPORTS, FISCAL YEAR 1963:

Japan's pack of canned king crab meat in fiscal year 1963 (March 1963-February 1964) from distant water areas--Bristol Bay, Okhotsk Sea (West Kamchatka), and the Olyutor Sea (off Siberian Coast)--totalled a record of 509,200 cases (48  $\frac{1}{2}$ -pound cans) due to the increase in pack from the Olyutor area. The pack in Bristol Bay and the Okhotsk Sea in 1963 was the same as in the previous year.

During the period 1956-1963, the Japanese king crab meat pack from Bristol Bay has shown almost a fourfold increase while the Okhotsk Sea pack has gradually declined. The Okhotsk Sea pack is subject to quota regulation by the International Northwest Pacific Fisheries Commission (Japan-Soviet Union).

Japanese exports of canned king crab during March 1, 1963-February 29, 1964, totaled

Month	United States	United Kingdom	Continental European Countries	Other Countries	Total
March . . . . .	14,585	325	2,797	756	18,463
April . . . . .	12,498	-	2,558	523	15,579
May . . . . .	4,469	1,450	2,231	360	8,510
June . . . . .	18,015	1,350	3,772	586	23,723
July . . . . .	23,002	4,862	2,786	275	30,925
August . . . . .	23,149	7,450	4,915	1,002	36,516
September . . . . .	19,423	10,580	9,353	1,268	40,624
October . . . . .	21,115	1,625	6,303	1,705	30,748
November . . . . .	9,173	10,050	9,070	1,286	29,579
December . . . . .	14,256	8,438	4,650	823	28,167
January . . . . .	10,996	13,575	4,115	906	29,592
February . . . . .	15,774	16,765	4,452	1,500	38,491
Total . . . . .	186,455	76,470	57,002	10,990	330,917

1/Standard cases of 48  $\frac{1}{2}$ -pound cans.

Japan (Contd.):

Table 2 - Japanese Pack of Canned King Crab Meat by Factoryship and Area, 1956-1963

Area and Factoryship	1963	1962	1961	1960	1959	1958	1957	1956
Bristol Bay (Spring Season) 1/:	(Standard Cases 2/)							
Tokai Maru . . . . .	120,000	60,000	80,000	80,000	70,000	59,850	59,850	59,850
Shinryo Maru . . . . .	-	-	3/22,000	3/18,100	-	-	-	-
Dainichi Maru . . . . .	115,000	3/100,000	-	-	-	-	-	-
Bristol Bay (Fall Season) 1/:								
Fishin Maru . . . . .	-	-	3/20,000	-	-	-	-	-
Chichibu Maru No. 2 . . . . .	-	-	3/30,000	-	-	-	-	-
Banshu Maru No. 31 . . . . .	-	-	3/20,000	-	-	-	-	-
Ishiyama Maru . . . . .	-	4/75,000	-	-	-	-	-	-
Shinryo Maru . . . . .	-	-	-	-	-	-	-	-
Total Bristol Bay pack . . . . .	235,000	235,000	172,000	98,100	70,000	59,850	59,850	59,850
Okhotsk Sea:								
Yoko Maru . . . . .	63,000	63,000	65,000	65,000	69,800	80,000	92,500	92,500
Kaiyo Maru . . . . .	63,000	63,000	65,000	65,000	69,800	80,000	84,000	73,500
Hokuyo Maru . . . . .	63,000	63,000	65,000	65,000	69,800	80,000	84,000	73,500
Shiranesan Maru . . . . .	-	-	65,000	65,000	70,600	80,000	84,000	73,500
Seiyo Maru . . . . .	63,000	63,000	-	-	-	-	-	-
Total Okhotsk Sea pack . . . . .	252,000	252,000	260,000	260,000	280,000	320,000	344,500	313,000
Olyutor Sea (off Siberian Coast):								
Matsuhisa Maru . . . . .	-	-	-	-	-	3/1,228	-	54,500
Uji Maru . . . . .	-	-	-	-	-	-	-	-
Ikema Maru . . . . .	-	-	-	3/3,722	-	-	-	-
Kutshima Maru . . . . .	-	-	-	3/14,744	-	-	-	-
Shikishima Maru . . . . .	-	3/1,700	3/4,445	-	-	-	-	-
Yoko Maru . . . . .	22,200	-	-	-	-	-	-	-
Total Olyutor Sea pack . . . . .	22,200	1,700	4,445	14,744	3,722	1,228	-	54,500
Total king crab pack . . . . .	509,200	488,700	436,445	372,844	353,722	381,078	404,350	427,350

1/Prior to 1961, Japanese king crab fishing in Bristol Bay was authorized only during the "spring season" (April-August). In 1961, the Japanese Fisheries Agency licensed king crab operations in Bristol Bay during the fall months as well as during the spring season.

In 1963, the Bristol Bay spring and fall fisheries were combined into a single season.

2/Standard cases of 48 1/2-pound cans.

3/Includes frozen king crab converted, for statistical purposes, to equivalent canned pack with the factor: 1 metric ton frozen crab meat per 100 standard cases of canned crab.

4/Combined production of Ishiyama Maru and Shinryo Maru.

330,917 cases, of which 56 percent was exported to the United States, 23 percent to the United Kingdom, 17 percent to countries in Continental Europe, and about 4 percent to other countries. (Fisheries Attache, United States Embassy, Tokyo, June 4, 1964.)

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#### REACTION TO NEW U. S. LAW ON FISHING IN TERRITORIAL WATERS:

President Johnson's statement on May 20, 1964, when he signed P. L. 88-308 (an act to prohibit fishing in territorial waters of the United States and in certain other areas by vessels other than vessels of the United States and by persons other than United States nationals or inhabitants), that the United States will give full consideration to Japan's long established king crab fishery in Bristol Bay, has dispelled the fear held among the Japanese Government and fisheries circles that the new law might shut out Japan from the Bering Sea crab fishery, according to Japan's

national economic trade journal Nihon Keizai Shimbun, May 21 and 22, 1964.

The periodical states that the new law has given rise to views within the Japanese Government that Japan should restudy her present policy of rigidly adhering to the principle of freedom of the high seas. It points out that great changes are occurring in the international fisheries, with fishing countries generally trending toward adopting the 12-mile territorial sea limit. The periodical adds that Japan's rigid adherence to the principle of freedom of the high seas, in the face of those developments, could lead toward isolating her in international fisheries. To prevent such an adverse situation, opinion is gaining ground within the Japanese Government that Japan should revise her basic policy on fishing on the high seas and should participate actively in international treaties, and thereby seek greater recognition of her vested fishing rights.

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Japan (Contd.):

#### SHRIMP IMPORT TRENDS:

Japan annually imports about 12,000-13,000 metric tons of frozen shrimp. Of that amount, approximately 40 percent is supplied by Mexico.

Japanese shrimp importers are disturbed over the occurrence of false labeling of frozen shrimp imported from Mexico. Unless the situation is remedied, they are said to be contemplating placing a voluntary ban on the purchase of Mexican frozen shrimp handled by certain United States trading firms. According to the Japanese firms, the deliveries of frozen shrimp often did not conform to their order specifications, although the labeling on the packages seemingly indicated that they did. For example, the contents of packages marked as white shrimp were, in fact, brown and sizes were smaller than those indicated on the packages. (Minato Shimbun, May 23, 1964.)

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#### 1964 FROZEN OYSTER PACK FOR EXPORT TO UNITED STATES:

A total of 180 metric tons of frozen oysters for export to the United States was packed in the first quarter of this year by a leading Japanese fishery firm. In 1963, a total of 350 tons of Japanese frozen oysters was exported to the United States, 250 tons of which are reported sold.

The composition of this year's Japanese frozen oyster pack by type of pack is: 40 tons tray-packed; 120 tons individually quick-frozen (bulk) packed; 20 tons block-packed.

The sale of frozen oysters in Japan has increased as a result of the Japanese firm's accelerated home sales campaign. (Shellfish Soundings, May 14, 1964.)

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#### FISH MEAL PRICES:

The Japanese firms operating fish meal factoryships in the Eastern Bering Sea are hopeful of receiving 62,000 yen (US\$172) a metric ton for their 1964 production of fish meal on the domestic market. Fish meal consumer organizations in Japan are countering with a price offer of 57,000 yen (US\$158) a ton.

Five Japanese factoryships are engaged in the production of fish meal in the Eastern Bering Sea this year. Their total production target amounts to slightly over 40,000 tons. (Suisan Keizai Shimbun, May 17, 1964.)

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#### MARINE OIL SUPPLY AND DISPOSITION, 1962-1963 AND 1964 FORECAST:

Edible Marine Oil: Japanese production of edible marine oils in calendar year 1963 was down about 10 percent from that in the previous year due mainly to lower production of fish oil. Edible whale oil production in 1963 was down only 3 percent, but Japanese production of whale oil was expected to show a considerable decline in 1964 and exports of edible marine oil are also expected to decline in 1964.

Table 1 - Japanese Supply and Disposition of Edible Marine Oils, 1962-1963 and 1964 Forecast

Item	Calendar Years		
	Forecast 1964	1963	1962
... (Metric Tons) ...			
<b>Supply:</b>			
<u>Opening stocks:</u>			
Fish oil and fish liver oil . . . .	9,854	18,475	10,342
Whale oil . . . . .	5,923	5,114	6,235
Total opening stocks, January 1	15,777	23,589	16,577
<b>Production:</b>			
Whale oil . . . . .	99,000	127,000	130,467
Fish oil . . . . .	32,200	24,700	39,780
Cod-liver oil . . . . .	7,800	7,300	7,771
Shark-liver oil . . . . .	1,800	1,500	1,201
Other fish-liver oil . . . . .	800	600	717
Total production . . . . .	141,600	161,100	179,936
Imports . . . . .	1,000	500	1,167
Total supply . . . . .	158,377	185,189	197,680
<b>Disposition:</b>			
Exports . . . . .	103,700	119,257	94,355
Domestic disappearance . . . . .	1/	1/	1/
1/Data not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic food uses of marine oils in fiscal year 1964 amounted to 52,500 tons--17,400 tons whale oil and 35,100 tons fish oil--all of which was consumed in the manufacture of margarine and shortening. In addition, 5,500 tons of fish oil was consumed for nonfood uses.)			

Inedible Marine Oil: Japanese production of inedible marine oil (sperm oil) in 1963 was up 12 percent from the previous year. Production and exports of sperm oil are expected to increase in 1964.

Foreign Trade in Edible and Inedible Marine Oil: IMPORTS: Japanese imports of marine oil are small and consist mainly of edible fish oil and shark-liver oil. Total imports of edible and inedible marine oils in 1963 were

## Japan (Contd.):

Table 2 - Japanese Supply and Disposition of Inedible Marine Oil (Sperm Oil) <sup>1/</sup> , 1962-1963 and 1964 Forecast			
Item	Calendar Years		
	Forecast 1964	1963	1962
	... (Metric Tons) ...		
<b>Supply:</b>			
Opening stocks, January 12/	7,332	6,509	6,785
Production	42,100	37,800	33,870
Imports	-	7	-
Total supply	49,432	44,316	40,655
<b>Disposition:</b>			
Exports <sup>3/</sup>	20,100	12,500	13,700
Domestic disappearance	4/	4/	4/

<sup>1/</sup> The Japanese supply of inedible marine oil consists of sperm oil.

<sup>2/</sup> Stocks held by oil processors.

<sup>3/</sup> Estimated by the Japanese Ministry of Agriculture and Forestry. The estimated exports of sperm oil are less than those shown in table 4. The exports of sperm oil shown in table 4 appear to include direct exports by fishing fleets.

<sup>4/</sup> Data not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic nonfood uses of sperm oil in fiscal year 1964 amounted to 22,000 tons.)

Table 3 - Japanese Imports of Marine Oils by Country of Origin, 1962 and 1963		
Commodity and Country of Origin	1963	1962
	... (Metric Tons) ...	
<b>Edible Marine Oil:</b>		
<b>Cod-liver oil:</b>		
Republic of Korea	-	83
Other countries	7	-
Total cod-liver oil	7	83
<b>Shark-liver oil:</b>		
Republic of Korea	-	56
Republic of China	76	110
Norway	49	65
United States	-	19
Other Countries	24	17
Total shark-liver oil	149	267
<b>Fish-liver oil:</b>		
Republic of Korea	-	18
Communist China	9	13
Republic of China	32	9
Hong Kong	21	28
United States	0	10
Other Countries	-	9
Total fish-liver oil	62	87
<b>Fish oil:</b>		
Peru	271	30
Angola	-	640
South Africa	1	-
Total fish oil	272	670
<b>Whale oil:</b>		
Ryukyu Islands	-	60
United States	10	-
Total whale oil	10	60
Total edible marine oils	500	1,167
<b>Inedible Marine Oil:</b>		
<b>Sperm oil:</b>		
United States	7	0
Total edible and inedible marine oils	507	1,167

Source: Japanese Customs Bureau, Ministry of Finance.

Table 4 - Japanese Exports of Marine Oils, by Country of Destination, 1962 and 1963		
Commodity and Country	1963	1962
	... (Metric Tons) ...	
<b>Edible Marine Oils:</b>		
<b>Whale oil:</b>		
Republic of Korea	-	544
North Korea	226	-
Communist China	-	1,016
Philippines	-	6
Sweden	-	3,302
United Kingdom	27,880	24,872
Netherlands	54,690	44,644
Belgium	5,080	-
France	13,564	-
United States	15,685	16,325
Australia	301	730
Total whale oil	117,426	91,439
<b>Cod-liver oil:</b>		
Malaysia	134	40
Philippines	13	20
Canada	113	139
United States	748	744
Other countries	54	20
Total fish oil	1,062	963
<b>Shark-liver oil:</b>		
United States	5	47
Other countries	12	63
Total shark-liver oil	17	110
<b>Other fish-liver oil:</b>		
Norway	33	52
Sweden	27	126
United Kingdom	38	124
Netherlands	59	120
Belgium	39	40
France	26	106
Canada	27	76
United States	293	334
Australia	5	77
Other countries	60	81
Total other fish-liver oils	607	1,136
<b>Fish oil:</b>		
Republic of Korea	90	30
Republic of China	-	94
Malaysia	-	20
United States	-	518
Other countries	24	8
Total fish oil	114	670
<b>Unclassified marine oil:</b>		
All countries	31	37
Total edible marine oils	119,257	94,355
<b>Inedible Marine Oil:</b>		
<b>Sperm oil:</b>		
Republic of Korea	-	37
Republic of China	17	19
United Kingdom	3,853	9,779
Netherlands	39,550	4,573
Belgium	-	3,302
West Germany	2,302	8,407
United States	7,532	14,381
Australia	304	-
Other countries	2	-
Total sperm oil	153,560	140,498
Total edible and inedible marine oils	172,817	134,853

<sup>1/</sup> Totals exceed estimated total exports of sperm oil shown in table 2.

Source: Japanese Customs Bureau, Ministry of Finance.

### Japan (Contd.):

down 57 percent from those in 1962 due mainly to smaller shipments from Angola and the Republic of Korea.

**EXPORTS:** Japanese exports of edible marine oils in 1963 were up 26 percent from those in the previous year due to larger shipments of whale oil which accounts for the bulk of Japanese edible marine oil exports. The leading buyers are the Netherlands, United Kingdom, France, and West Germany.

Exports of inedible sperm oil (as reported by the Japanese Customs Bureau) were also up in 1963 due mainly to larger shipments to the Netherlands.

Note: See Commercial Fisheries Review, July 1963 p. 83.

\* \* \* \* \*

### JAPANESE MAY PURCHASE DUTCH WHALING FACTORYSHIP:

The three large Japanese fishing companies engaged in whaling in the Antarctic Ocean will likely sign an agreement to purchase the Netherlands Whaling Company's whaling factoryship Willem Barendsz (26,830 gross tons), including that factoryship's six-percent international whale-catch quota. The purchase was to be made after the June 1964 International Whaling Conference, according to informed industry sources. In January 1964 the President of the Netherlands Whaling Company had offered to sell its factoryship to Japan. However, the Japanese firms, after meeting with the Fisheries Agency, decided at that time not to commit themselves on the offer until after the June conference. (Suisan Keizai Shimbun, May 14, 1964.)



### Mexico

#### SHRIMP VESSELS BUILT FOR KUWAIT:

Mexico is becoming an important factor in supplying foreign fisheries with shrimp vessels. A shrimp vessel built in Mexico has been operating successfully off Pakistan, and a shipyard on the Pacific coast of Mexico has received orders for the construction of twelve 67-foot steel shrimp vessels for Kuwait. Orders have also been received from Brazil and Chile.

Four of the shrimp vessels for Kuwait were completed in May 1964 and the other 8 are

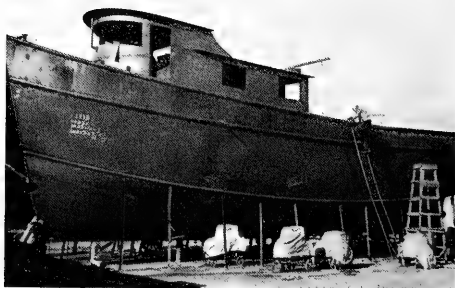


Fig. 1 - Steel shrimp trawler (67 feet) under construction at a shipyard in Mazatlan, Mexico, for export to Kuwait.

nearing completion. The vessels are being delivered ready to fish and are fully equipped with nets, radio, direction finder, echo-sounder, brine refrigeration equipment, and fiberglass skiffs. The machinery and most of the electronics equipment installed were manufactured in the United States, although Japanese echo-sounders have been used. The vessels are equipped with special machines to sort shrimp by size.

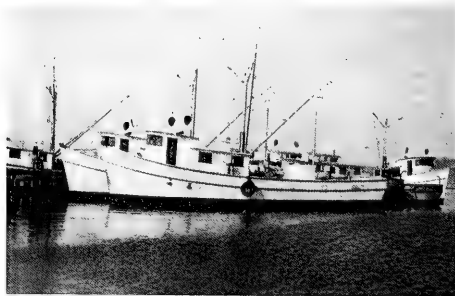


Fig. 2 - Several of the 12 steel shrimp vessels built for Kuwait. Four were ready to ship in 10 days.

Designed for operation in the tropics, the vessels have been built to identical specifications to facilitate maintenance in remote areas. They are designed to carry a crew of 25, about twice the size of Mexican crews on comparable vessels.

The new vessels will be delivered to Kuwait by freighter. They will be accompanied by experienced 3-man Mexican crews--captain, engineer, and seamen--who will remain with the vessels under 18-months contracts



## Mexico (Contd.):



Fig. 3 - Steel shrimp vessels ready to leave for Kuwait, fully equipped and ready to fish. Mexican captain, engineers, and 1 crewman for each vessel are provided on an 18-months contract.

to train Kuwait fishermen. (United States Embassy, Mexico, D.F., June 1, 1964.)

\* \* \* \* \*

## SECONDARY FISHERIES OF SINALOA:

The Mexican state of Sinaloa and its principal fishing port Mazatlan on the Gulf of California are known throughout the fishing world for their shrimp industry. However, some of the lesser known fisheries in the area are also of interest. Those include, among others, the sport fishery, a canoe fishery, a sea turtle fishery, and a shark fishery.



Fig. 1 - Part of the 270-vessel shrimp fleet fishing out of Sinaloa's principal fishing port of Mazatlan.

Mazatlan Sport Fishery: Excellent fishing for marlin and sailfish is the lure that brings many tourists to Mazatlan. A fleet of about

40 sport fishing charter vessels operates out of Mazatlan for large game fish. Daily charter rates range from US\$50 to \$65 during the season from November through May and about \$40 during the remainder of the year. Rates include tackle and bait as well as the services of the skipper and a deckhand for 2 to 3 sport fishermen. The rate for longer trips to offshore islands is about \$120 per day. Part-day trips for numerous smaller game fish are \$6 per hour.



Fig. 2 - Mazatlan as seen by a returning shrimp vessel.

The season for striped marlin, which is the principal game fish, is from January into May. Sailfish are available from early May to November. The large black marlin are taken in May, June, and July. At times, all three varieties are caught in a single day.



Fig. 3 - Fiberglass charter sport fishing boat being built in a shipyard in Mazatlan. Steel shrimp vessels can be seen in background.

When all 40 charter sport vessels are fishing, which is a frequent occurrence, the total gross daily income for charters runs from \$1,600 to \$2,400. In addition, other craft fishing for the smaller game fish also bring in a sizable income. The Mazatlan sport fishery provides a livelihood for some 80 to 100 crewmen and 40 employees of the landing wharfs for the sport fleet. It also helps support the fishermen who catch mullet for bait, and brings additional income to boatyards and suppliers.

### Mexico (Contd.):

The total Mazatlan sports catch of marlin and sailfish amounts to over 5,000 fish a year. Virtually all of those are given by the anglers to the crew for sale at extremely low prices for the manufacture of fish meal. Realizing that marlin taken in the Japanese tuna fishery are used for fish sausages, the Mexican Department of Fisheries is seeking ways to use the sport-caught fish in its program to increase the consumption of fishery products.

**Mazatlan Canoe Fishery:** In picturesque contrast to Mazatlan's modern fleet of shrimp trawlers and shrimp processing plants, is the fleet of dugout canoes that calls the beach in front of luxurious resort hotels its home port. The canoe fleet consists of about 100 craft.



Fig. 4 - Hand-line canoes on the beach at Mazatlan--fish for sierra, snapper, corvina, cabrilla, etc.

Nearly all are dugouts but a few are fiberglass. Most of the canoes are powered by small inboard engines. The canoes, manned by 1 or 2 fishermen, usually fish within sight of the beach. Their catches are made with hook and line, and include sierra, corvina, cabrilla, and snapper. Some of the catch is purchased by local buyers for retail markets and hotels, but much of the catch is shipped by truck to Mexico City and Guadalajara.

**Sea Turtle Fishery:** One of the cooperatives in Sinaloa maintains a sea turtle fishery. During April 1964, a sea turtle catch of over 30 tons was taken by the cooperative. The sea turtles, known as caguama or cahuama, provide both leather and meat. The leather is used for luxury products. The meat is consumed locally to a large extent. The flipper meat is used in a soup that is a favorite dish of Mazatlan.

The director of the Mazatlan Biological Station of the Mexican Department of Fisheries has stated that the sea turtle resource is rather limited and under constant threat from unauthorized egg gathering on the beaches. (Sea turtles go ashore to deposit their eggs.) Nevertheless, if supervised carefully, the fishery could probably be expanded somewhat.

**Shark Fishery at Teacapan:** The village of Teacapan at the Southern tip of Sinaloa is known for its shrimp and oysters. From mid-September to early December the town is bustling with activity as close to 1,000 local canoes are busy producing shrimp for the cannery and freezing plant in nearby Escuinapa. During other seasons, the fishermen are employed in the oyster fishery, the tourist sport fishery, and the shark fishery. The Teacapan shark fishery does not compare with the modern large-scale shark fisheries operating at Mazatlan, Islas Tres Marias, and Zihuatanejo. But the Teacapan operation is typical of the small shark fisheries at dozens of remote villages all along the coast.



Fig. 5 - Right of center is a shark fishing boat, Teacapan, Sinaloa.

A few small power boats operate in the ocean waters near the Teacapan lagoon, landing shark catches on the sandy beach at the village. The



Fig. 6 - Butchering 4 large sharks on the beach at Teacapan.

## Mexico (Contd.):

sharks are dressed on the beach and the fillets are washed in the lagoon. The meat is salted and sun-dried on racks. The resulting product is said to be similar to dry-salted



Fig. 7 - After the shark fillets are washed, they are put on racks to dry. The product is sold as "bacalao de tiburón." In left foreground, shark fins are on the racks to dry.

cod. In fact, it is called "bacalao de tiburón" or codfish-style shark. The product is shipped to the cities for sale by the National Company of Popular Subsistence (CONASUPO) to limited-income groups. It is also sold in the markets. CONASUPO has prepared a pamphlet of recipes that features "bacalao de tiburón." The shark fins are similarly dried for use in soup. Mexican exports of dried shark fins (mainly to the United States) amount to about 70,000 pounds annually, valued at \$28,000. (Fisheries Attache, United States Embassy, Mexico, D.F., June 1, 1964.)



## Netherlands

## FISH MEAL PRICES, 1962-1963:

During January-September 1963, fish meal prices in the Netherlands averaged lower than those in the same period of 1962; but in the final quarter of 1963 an upward trend carried Dutch fish meal prices above those in the last

Average Monthly Prices <sup>1/</sup> of Fish Meal in the Netherlands, 1962-1963				
Month	1963		1962	
	Guilfers/ Metric Ton	US\$/ Short Ton	Guilfers/ Metric Ton	US\$/ Short Ton
January . . .	547	137.6	578	145.4
February . .	546	137.4	560	140.9
March . . .	529	133.1	542	136.3
April . . .	522	131.3	540	135.8
May . . . . .	513	129.1	543	136.6
June . . . . .	513	129.1	528	132.8
July . . . . .	508	127.8	520	130.8
August . . .	502	126.3	508	127.8
September . .	505	127.0	517	130.1
October . . .	535	134.6	518	130.3
November . .	542	136.3	539	135.6
December . .	579	145.7	552	138.9

<sup>1/</sup>Brokers' prices to users for 61.4 percent protein meal.  
Source: Netherlands Central Bureau of Statistics.

quarter of 1962. (United States Embassy, The Hague, April 24, 1964.)

\* \* \* \* \*

## MARINE OIL SUPPLY AND DISPOSITION, 1963 WITH COMPARISONS:

**Supply and Disposition:** In 1963, there was an increase of about 56 percent in domestic production of marine oils in the Netherlands, although imports continued to provide the bulk of the total supply. Domestic use absorbed 73 percent of that supply, 8 percent was exported, and 19 percent was carried over on December 31, 1963.

Table 1 - Netherlands Supply and Disposition of Marine Oils, 1963	
Item	1953 Metric Tons
<b>Supply:</b>	
Opening stocks, January 1 . . . . .	18,306
Imports . . . . .	1/95,500
<b>Production<sup>2/</sup>:</b>	
Whale oil . . . . .	8,130
Other marine oils . . . . .	3,654
Total production . . . . .	11,784
Total supply . . . . .	125,590
<b>Disposition:</b>	
<b>Exports:</b>	
As oils <sup>3/</sup> . . . . .	5,967
As oil in products . . . . .	4,600
Total exports . . . . .	10,567
<b>Domestic disappearance:</b>	
Food use . . . . .	82,466
Other use . . . . .	8,868
Total domestic disappearance . . . . .	91,334
Closing stocks, December 31 . . . . .	23,689

<sup>1/</sup>Does not completely agree with data reported in table 2.

<sup>2/</sup>Production entirely from Dutch raw material.

<sup>3/</sup>Does not include fish-liver oil.

Source: Estimates based on preliminary data issued by the Netherlands Product Board for Margarine, Fats, and Oils.

## Netherlands (Contd.):

Table 2 - Netherlands Imports of Fish and Marine-Animal Oils, 1962-1963

Commodity and Origin	1963			1962		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Guilders	US\$1,000	Metric Tons	1,000 Guilders	US\$1,000
<b>Fish-Liver Oil:</b>						
European Economic Community . . . . .	337	205	57	379	190	53
Iceland . . . . .	29	19	5	150	62	17
Norway . . . . .	311	352	98	303	298	83
Portugal . . . . .	554	359	99	25	16	4
Japan . . . . .	59	389	108	123	732	203
Other countries . . . . .	59	67	19	48	50	14
Total fish-liver oil . . . . .	1,349	1,391	386	1,028	1,348	374
<b>Fish Oil:</b>						
European Economic Community . . . . .	2,171	884	245	2,265	841	233
Iceland . . . . .	1,235	681	189	429	144	40
United States . . . . .	17,398	10,040	2,784	14,999	5,531	1,534
Peru . . . . .	33,706	12,796	3,548	18,560	6,536	1,812
Chile . . . . .	7,501	3,300	915	5,632	1,884	523
Other countries . . . . .	1,067	581	161	965	372	103
Total fish oil . . . . .	63,078	28,282	7,842	42,850	15,308	4,245
<b>Whale Oil:</b>						
Iceland . . . . .	-	-	-	1,016	713	198
Norway . . . . .	9,481	5,048	1,400	1,480	809	224
Japan . . . . .	12,381	6,567	1,821	10,177	5,612	1,556
Other countries . . . . .	770	349	97	1	1	1/
Sea deliveries <sup>2/</sup> . . . . .	3,824	2,458	682	21,453	10,089	2,798
Total whale oil . . . . .	26,456	14,422	4,000	34,127	17,224	4,776
<b>Other Fats from Marine Products:</b>						
Norway . . . . .	114	98	27	105	108	30
Portugal . . . . .	488	392	109	265	216	60
United States . . . . .	1,241	779	216	934	601	167
Peru . . . . .	-	-	-	644	487	135
Japan . . . . .	66	59	16	178	140	39
Other countries . . . . .	37	40	11	47	56	15
Total other marine fats . . . . .	1,946	1,368	379	2,173	1,608	446
Total imports of marine oils . . . . .	92,829	45,463	12,607	80,178	35,488	9,841

1/Less than \$500.

2/From whale oil production vessels other than those in Dutch fleets.

Source: Netherlands Central Bureau of Statistics.

Table 3 - Netherlands Exports of Fish and Marine-Animal Oils, 1962-1963

Commodity and Destination	1963			1962		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Guilders	US\$1,000	Metric Tons	1,000 Guilders	US\$1,000
<b>Fish-Liver Oil:</b>						
European Economic Community . . . . .	112	89	25	279	139	39
Other countries . . . . .	17	18	5	30	30	8
Total fish-liver oil . . . . .	129	107	30	307	169	47
<b>Fish Oil:</b>						
European Economic Community . . . . .	2,236	1,135	315	1,881	772	214
Sweden . . . . .	-	-	-	98	49	14
Other countries . . . . .	142	60	16	76	43	12
Total fish oil . . . . .	2,378	1,195	331	2,055	864	240
<b>Whale Oil:</b>						
European Economic Community . . . . .	301	174	48	5,144	3,919	1,087
Norway . . . . .	266	107	30	-	-	-
Other countries . . . . .	8	1	1/	15	9	2
Total whale oil . . . . .	575	282	78	5,159	3,928	1,089
<b>Other Fats from Marine Products:</b>						
European Economic Community . . . . .	58	46	13	1,157	927	257
United States . . . . .	2,951	2,361	655	305	244	68
Other countries . . . . .	5	5	1	15	18	5
Total other marine fats . . . . .	3,014	2,412	669	1,477	1,189	330
Total exports of marine oils . . . . .	6,096	3,996	1,108	8,998	6,150	1,706

1/Less than US\$500.

Source: Netherlands Central Bureau of Statistics.

## Netherlands (Contd.):

**Imports:** Total imports of marine oils by the Netherlands in 1963 were up 16 percent in quantity and 28 percent in value from those in the previous year due mainly to larger shipments of fish oil from Peru, the United States, and Chile. The gain was partly offset by a decline in total whale oil imports which were reduced by a drop in direct deliveries by foreign fishing fleets. (Imports of whale oil from Norway were substantially higher in 1963.) With a decline in world production of whale oil in 1963, whale oil prices at Rotterdam showed a substantial gain (table 4).

Table 4 - Wholesale Price of Whale Oil, c.i.f. Rotterdam, at Selected Intervals, 1962-1963

Month <sup>1/</sup>	1963		1962	
	Guilders/ 100 Kilos	U.S. Cents/ Pound	Guilders/ 100 Kilos	U.S. Cents/ Pound
March . .	64.5	8.1	51.1	6.4
June . . .	74.3	9.3	48.7	6.1
September	79.5	10.0	45.7	5.7
December	81.8	10.3	42.0	5.3

<sup>1/</sup>Mid-month prices.

Source: Netherlands Ministry of Agriculture.

**Exports:** Total exports of marine oils from the Netherlands in 1963 were down 32 percent in quantity and 35 percent in value from those in 1962 due to a sharp drop in shipments of whale oil. The European Economic Community (EEC) was the leading buyer of all types of Dutch marine oil in 1962. In 1963, the EEC continued to be the leading market for Dutch fish oil, but the United States replaced the EEC as the main market for processed fats from marine oils. (United States Embassy, The Hague, April 24, 1964.)

Notes: (1) Netherlands guilder 3.606 equals US\$1.00.

(2) See *Commercial Fisheries Review*, July 1964 p. 69, Dec. 1963 p. 74, Jan. 1963 p. 106.

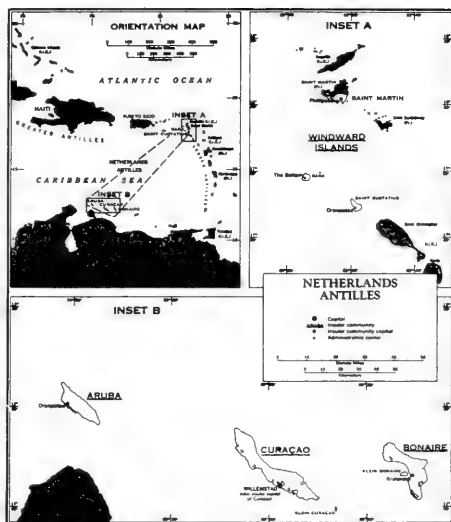


## Netherlands West Indies

## SIX TUNA ICE VESSELS ASSIGNED TO NETHERLANDS WEST INDIES BASE:

One of the larger Japanese fishing firms contracted for six tuna ice vessels (ranging in size from 99 to 190 gross tons) to fish out of its base at Saint Martin, Netherlands West Indies. The Saint Martin base has a 2,000-ton fresh tuna export quota.

That firm had about 35 tuna vessels fishing for it in the Atlantic Ocean in 1963, and handled about 20,000 metric tons of Atlantic



Ocean-caught tuna. Of that amount, 90 percent was exported. (*Suisancho Nippo*, June 4, and May 30, 1964.)



## Norway

## LOFOTEN COD FISHERY DISAPPOINTING IN 1964:

Total landings from the 1964 Norwegian Lofoten cod fishery amounted to only 23,700 metric tons at the close of the season April



Shows a Norwegian line-fishing boat boating cod.

## Norway (Contd.):

20. That was a decline of 4,600 tons from the catch in 1963, and the second lowest catch since World War II. Most of the fishermen who participated in the Lofoten cod fishery in 1964 will be eligible for State aid under the Act of Minimum Shares which guarantees fishermen a minimum weekly income.

The Lofoten area is in the path of spawning cod passing from the Barents Sea to the coast of Norway. During the last 8 years, the total annual Norwegian catch of spawning cod along the entire coast from Møre to Finmark (including the Lofoten area) has been reduced by about 50 percent to 49,200 tons in 1964. According to statements made by several representatives of the fishermen, the downward trend in the cod catch off the coast of Norway is mainly due to overfishing of stocks in the Barents Sea. (United States Embassy, Oslo, May 17, 1964.)

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#### IMPROVED ECHO-SOUNDER OFFERED BY NORWEGIAN FIRM:

A sonar device with a range of 6,500 feet in any direction (twice the range of conventional sonars) has been introduced by an electronics firm in Norway. The company claims the new instrument can determine the location and direction of fish schools with accuracy. It was designed specifically to meet the needs of Norwegian herring fishermen, but can be used in other fisheries. It can be operated automatically or by push-button control, and can be installed in vessels as small as 70 feet. (News of Norway, May 28, 1964.)



## Pakistan

#### SHRIMP PROCESSING CAPACITY OF PLANTS IN KARACHI:

A total of 14 shrimp freezing and processing plants (2 more than in 1962) are located in Karachi, Pakistan, each with an average daily capacity of 10 metric tons. When operating six days a week, their combined annual capacity has a potential of about 42,000 tons. In 1963, however, only 18,400 tons of shrimp were landed for the use of those plants.

A new shrimp freezing plant on the Mekran coast at Gwadar which was to have opened



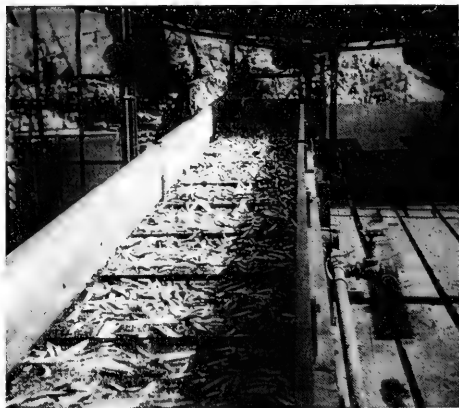
in 1963 was not yet in operation, according to latest reports. (United States Embassy, Karachi, May 15, 1964.)



## Peru

#### FISH MEAL PRODUCTION AND EXPORTS, JANUARY-APRIL 1964:

Peruvian fish meal production in January-April 1964 was reported to be 655,000 metric tons, or 48 percent more than the 443,300 tons produced during the same period of 1963.



Anchovetas going to plant--Chimbote. Conveyor at Star Kist plant in operation.

Peruvian fish meal exports during the first 4 months of 1964 amounted to 531,000 tons, an increase of 18 percent from the 451,000 tons exported during the same period of 1963. (Unpublished sources.)

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Peru (Contd.):

### FISH MEAL EXPORT FORECAST FOR 1964:

Authoritative industry sources predict total Peruvian fish meal exports in 1964 will reach 1.2 million metric tons, a considerable increase over the 1.04 million tons exported in 1963. Based on available data for the first quarter, prospects for record output and exports look favorable. In the first 3 months of 1964, production totaled almost 500,000 tons, up more than 50 percent from the corresponding period a year ago when output was cut by a labor dispute. Exports for the first quarter of 1964 (amounting to 389,000 tons) reflect an increase of approximately 10 percent over January-March 1963, despite a port strike in February 1964 which held export volume down. Inventories at the end of March 1964 were higher than a year earlier so, on the basis of continued good demand, last year's export record should be surpassed.

(Editor's note: In late May 1964, Peruvian fish meal prices were reported as US\$123-125 per ton (65 percent protein meal) f.o.b. United States East Coast and Gulf ports as against comparable prices of \$117-119 per ton in late May 1963.)

Rapid expansion of the Peruvian fish meal industry during the past two years coupled with spotty fishing in some ports has brought on a financial crisis. But production continues high in spite of the closing of some 30 plants (most of those marginal) over the past 4 months. Heavy production is expected to continue, unless there is a disappearance of fish or a break in the market price. The Peruvian Government is expected to offer some form of tax relief in the near future that will enable efficient operators to survive. (United States Embassy, Lima, May 12, 1964.)

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### MARINE OIL SUPPLY AND DISPOSITION, 1961-1963 AND 1964 FORECAST:

**Fish Oil:** Peruvian production and exports of fish oil declined in 1963 after a sharp increase during the 1960-1962 period, according to estimates by the Peruvian industry. Greatly improved extraction processes helped boost Peruvian fish oil production to a record level in 1962. The anchoveta catch is the mainstay of the Peruvian reduction industry and domestic production of fish oil is the

main factor in the Peruvian marine oil supply. Imports are small.

Estimates indicate that Peruvian stocks of fish oil were at a low level at the beginning of 1964. Production of fish oil in 1964 is expected to continue at about the same level as in 1963, although exports may be somewhat lower in 1964.

Peruvian Supply and Disposition of Fish Oil, 1961-1963 and 1964 Forecast

	Forecast 1964	1/1963	1962	1961
	(Metric Tons) . . . . .			
<b>Supply:</b>				
Opening stocks, Jan. 1	1,000	5,000	12,500	6,000
Production <sup>2/</sup> . . . . .	120,000	120,000	155,000	118,886
Imports . . . . .	3/	3/	3/	3/
Total supply . . . . .	121,000	125,000	167,500	124,886
<b>Disposition:</b>				
Exports <sup>2/</sup> . . . . .	103,500	110,035	150,596	102,306
Domestic disappearance:				
Apparent edible consumption <sup>2/</sup> . . . . .	6,000	5,000	4,000	3,300
Estimated industrial consumption <sup>2/</sup> . . . . .	10,000	8,965	7,904	6,780
Closing stocks, Dec. 31	1,500	1,000	5,000	12,500
1/ Preliminary.				
2/ Reported by Peruvian National Fisheries Society.				
3/ Complete data not available on Peruvian imports; however, imports are relatively insignificant. (The Callao Customs-house reported Peruvian imports of inedible fish oil in 1963 as 363 tons of hydrogenated fats and oils and 79 tons of cod-liver oil.)				
4/ Estimates by Peruvian industry. Data include fish oil for both edible and inedible purposes. Data may not agree with export data reported by other sources.				
5/ Estimates from unpublished sources.				
Note: The table does not include data on the supply and disposition of whale and sperm oil.				

**Whale and Sperm Oil:** Peruvian exports of sperm oil amounted to 9,079 metric tons valued at \$34.6 million (US\$1.3 million) in 1963 as compared with 9,336 tons valued at \$34.5 million (US\$1.3 million) in 1962, according to data from the Peruvian Customs Office. Exports of refined whale oil amounted to 400 tons valued at \$901,000 (US\$33,600) in 1963. There were no registered exports of whale oil in 1962. (United States Embassy, Lima, April 28, 1964.)

Note: See *Commercial Fisheries Review*, Feb. 1964 p. 79, and June 1963 p. 86.



### Philippines

#### GOVERNMENT OPENED ANOTHER BID ON IMPORTED CANNED SARDINES:

The Philippine National Marketing Corporation (NAMARCO) opened another bid on June 2,

### Philippines (Contd.):

1964, for 499,800 cases of canned sardines. The bid carried the provision that 245,000 cases be already packed and ready for delivery, and the remainder of 254,800 cases subject to pack. Two of the bidders represented United States suppliers, one a British supplier, and 7 bidders represented South African suppliers.

The bid offered by the United States Supplier was for 50,000 cases of 1-pound ovals at US\$9.22 a case (48 cans per case) and 6,000 cases of 1-pound talls at \$6.48 a case (48 cans per case). South African case (48 cans) prices on the same quantity were \$8.00 for ovals and \$6.15 for talls. The British offer was for 60,000 cases (95 cans) of "jitneys" (5-ounce) at \$7.45 and the South African bid for the same was \$7.15 a case. NAMARCO indicated that it probably would reject the United States and British bids in favor of the lower-priced South African product because the Government justified imports from South Africa on the basis of cheaper food for the consumer.

Bids on the 254,800 cases subject to pack were all from South African suppliers. NAMARCO indicated that if it could obtain firm offers of sardines already packed it might reject the South African bids on that quantity. (United States Embassy, Manila, June 11, 1964.)



### South Africa Republic

#### FISHING VESSEL MAKES REMARKABLY GOOD ANCHOVY CATCHES:

Large catches of anchovy were made in April 1964 by the 67-foot pilchard vessel Silver Bonito which fishes out of St. Helena Bay in South Africa.

On April 9, the Silver Bonito caught 70 short tons of anchovy in one set of the net; on April 10 she returned at 8 p.m., after having left the dock at 9 a.m. the same day with 140 tons which were caught in two sets; on the morning of April 13, after being out for the night, she returned with 120 tons and the same evening caught a further 70 tons.

The catches were made about two hours' sailing time from the fishing company's fac-

tory. At the factory, the anchovies were processed for fish meal in the same way as the pilchard catches. The fish meal was of the same quality as that obtained from pilchards but slightly darker. The oil yield was good.

The Silver Bonito is equipped with one of the six  $\frac{3}{4}$ -inch mesh anchovy nets in use in that industry for experimental purposes. The net had been remodeled, after previous use, to the specifications of the fishing company. (The South African Shipping News and Fishing Industry Review, April 1964.)



### South-West Africa

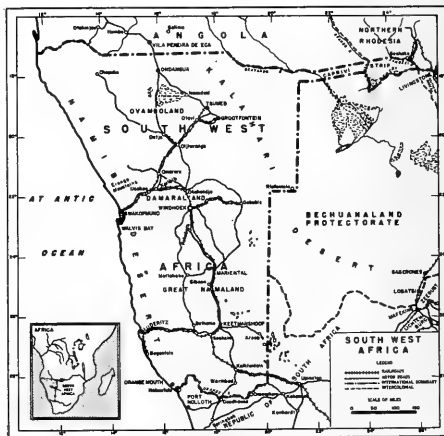
#### PILCHARD SEASON AT WALVIS BAY GETS UNDER WAY:

The 1964 pilchard fishing season at Walvis Bay in South-West Africa started on February 16, 1964 when two factories sent their vessels out for the first time. The pilchards were being found in reasonable quantities about an hour's sailing from Pelican Point. The condition of the fish was described as "good for the time of the year" and the early oil yield has been about 10 gallons a ton.

The other four factories in Walvis Bay were to start during the second half of February.

This year the factories will be concentrating on the production of fish meal and fish body oil for which there are ready markets. The canning program will again, as in 1963, be cut back. Each factory is limited to a ceiling catch of 90,000 tons, but this could be increased by the South-West Africa Administration if the markets for the finished product and the availability of fish warrant it.

By the last week of February, all six of the pilchard-processing factories at Walvis Bay were in operation. The seventh





There is considerable concern regarding competition in the export market and the domestic demand for canned fish is not strong enough to absorb a significant portion of the production. One remedy which was believed would improve the situation was the export of canned fish packed in peanut oil. This is

Species	1964			1963					
	January-March			October-December			January-March		
	Quantity	Avg. Price		Quantity	Avg. Price		Quantity	Avg. Price	
	Metric Tons	Pesetas/Kilo	U.S.\$/Lb.	Metric Tons	Pesetas/Kilo	U.S.\$/Lb.	Metric Tons	Pesetas/Kilo	U.S.\$/Lb.
Small hake . .	4,503	26.47	20.0	4,675	25.50	19.3	3,992	27.82	21.0
Horse mackerel	1,934	4.69	3.5	3,034	4.14	3.1	1,388	8.32	6.3
Octopus . . . .	906	7.09	5.4	357	7.41	5.6	2,109	6.81	5.2
Tuna . . . . .	538	18.64	14.1	-	-	-	770	13.18	10.0
Hake . . . . .	232	50.57	38.3	135	56.09	42.4	311	48.24	36.5

## Spain (Contd.):

Table 2 - Distribution of the Fishery Landings at Vigo, January-March 1964 with Comparisons

Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, Drying, Fish Meal, etc.) and Local Consumption
	(Metric Tons)		
1st Quarter 1964 . . . .	11,139	890	3,643
4th Quarter 1963 . . . .	12,020	5,364	3,215
1st Quarter 1963 . . . .	9,338	1,573	4,721

now discounted because of the excellent olive crop and the expected drop in the price of olive oil. It was reported that the difference between the price of peanut oil and olive oil would not exceed one peseta (1.6 U. S. cents) a liter, and that it would hardly be reflected in the price of the canned product. (United States Consulate, Vigo, April 14, 1964.)

Note: See Commercial Fisheries Review, March 1964, p. 68.



## Thailand

FISHERIES SURVEY PLANNED

The Fisheries Department of Thailand has announced plans for a survey of fishing grounds off Thailand. The survey vessel Dhanarajata is scheduled to arrive in Bangkok in mid-1964 to begin explorations in the Gulf of Thailand. After a few months work in the Gulf, during which the crew will become familiar with the vessel's equipment, the Dhanarajata is expected to transfer operations to the potentially more important Andaman Sea. Thailand has not previously engaged in intensive fishing operations in that area. The survey is designed to indicate the quantity and quality of available fish stocks, including tuna stocks. (United States Embassy, Bangkok, May 11, 1964.)



## U. S. S. R.

FISHING FLEETS CLAIMED SEEKING FISH RATHER THAN PROFITS:

Soviet fishing fleets are working to supply their country with food; fishing operations need not be justified on an economic basis. That was indicated by a representative of the Soviet Embassy in London during a talk in Grimsby, England, March 31, 1964. The Soviet representative's remark was made in reply to a question as to whether Soviet fisheries were self-sustaining from a profit

standpoint. (Fish Trades Gazette, April 4, 1964.)

\* \* \* \* \*

SOVIETS CLAIM MARINE GROUPS CAN BE IDENTIFIED BY SOUND WAVES:

A classification of marine specimens according to ability to reflect acoustic waves has been reported by Soviet scientists. They state that probing of the Atlantic with sound waves has revealed four types of marine life which can be identified in schools by different degrees of scattering of sound.

The first group is composed of marine life 10 to 150 millimeters (0.39-5.91 inches) in diameter and lacking a solid skeleton or rigid shell (jellyfish and similar specimens) which are called semireflectors of sound.

A second group includes octopus which are denser and have a thin skeletal foundation. A still greater obstacle to sound is presented by the group of higher shellfish (crustaceans) covered with a hard dense shell. Finally, the Soviets report that a substantial effect of sound scattering is produced by fish. A particularly noticeable sound dispersal, in the range of several kilocycles at least, is said to be produced by fish possessing swimming bladders.

Soviet scientists state that the use of sound waves to locate schools of fish will make it possible to determine the size and in some cases even the species of fish. (The Fishing News, April 3, 1964.)



## United Kingdom

FISH MARKETING INFORMATION SERVICE INTRODUCED BY WHITE FISH AUTHORITY:

The inauguration of a Fish Information Service was announced by the chairman of the British White Fish Authority in early May

## United Kingdom (Contd.):

1964. The new service will make available to individual fish retailers the professional services of a shop design and improvement group. It will also provide advice on retailing methods and undertake promotional campaigns.

Introducing the new service, the chairman of the White Fish Authority pointed out that in recent years there have been drastic changes in almost every aspect of retailing, and a revolution in the housewife's method of shopping. The advent of the supermarket has had a great influence on shopping habits. The individual shopkeeper is, therefore, faced with the need for the highest degree of efficiency, and the modernization of his premises if he is to maintain his place in the market. Modern knowledge and ideas are being applied to the catching of fish; it is essential that attention should also be given to the manner in which the product is presented to the consumer. Furthermore, it should be stressed to the housewife that fish can be as important as meat in the daily diet. The aims of the Fish Information Service were described as, "The presentation of fish as a dish which is fashionable, satisfying, and convenient, from shops which embody the latest developments in retail design."

To achieve its purpose, the new Fish Information Service will perform three basic functions. First, it will provide a clearing house for information on the fish industry as a whole. Second, it will offer the industry a shop improvement service which will be aimed at helping the retailer to sell fish as the main family meal. And third, it will carry out an educational campaign to present to cookery students, catering establishments, restaurants, and the general public the message that fish is as suitable for the main dish as meat.

The chairman of the White Fish Authority said, "in short, the service forms part of the

overall campaign to present fish as 'the big dish.' Everyone knows the phrase 'Chips with everything.' Let us hope that before long there will be an equally well-known phrase--'Fish with everything!'" (Fish Trades Gazette, May 2, 1946.)

\* \* \* \* \*

VESSEL AND GEAR RESEARCH:

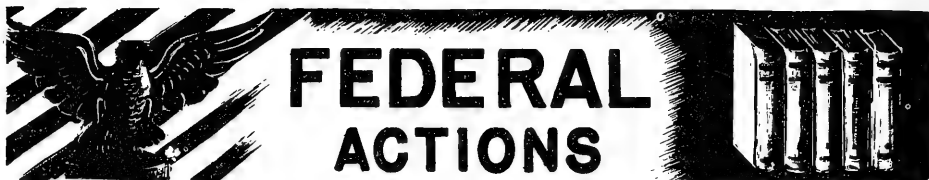
A representative of the British White Fish Authority in April 1964 described the work undertaken by the Authority's Industrial Development Unit at the port of Hull during the first year of the new unit's existence. He pointed out that the members of the unit had spent considerable time aboard trawlers at sea. If the design of the vessels is to be improved, performance under working conditions must be studied.

The unit made comprehensive measurements of the motions of trawlers in a seaway. The information obtained will help guide the design of improved echo-sounders and new refrigerating machinery, and the layout of galleys and accommodations in new stern-trawlers.

A study was made of the use and performance of the trawl winch aboard the freezer-trawler *Junella*. That led to recommendations which could significantly increase the earnings and reduce the costs of such vessels.

Other development projects being conducted include a wireless telemetry link from trawl to ship, to provide skippers with information about water temperature and the behavior of the trawl; a meter to inform the skipper about the tension in the trawl warps, in order to expedite shooting and hauling the net; new methods of fish stowage to avoid handling on discharge; washing and gutting machines; pneumatic transport of crushed ice; high-pressure hydrostatic power transmissions; and a stabilized narrow-beam echosounder. (Fish Trades Gazette, April 18, 1964.)





## Federal Trade Commission

### BARS DISCRIMINATION IN RENTALS AND SALES OF SHRIMP PEELING MACHINERY:

On June 4, 1964, the Federal Trade Commission (FTC) ruled that officers and directors of two Louisiana corporations distributing shrimp peeling machinery have abused their patent rights in the shrimp processing machinery field. The FTC, therefore, issued an order barring certain discriminatory practices. The officers and directors of the firms concerned were ordered to: (1) stop discriminating among domestic shrimp producers in the rentals charged for their machines; and (2) offer their machines for sale to domestic canners at the same prices and under the same conditions and terms as are presently offered to foreign canners.

On the other hand, the FTC dismissed allegations that the shrimp peeling machinery patent holders had used various unlawful means to gain, perpetuate, or extend a monopoly position in the shrimp processing machinery field.

The FTC ruled that members of the family which are officers and directors of the Louisiana corporations involved have unlawfully abused their patent-based monopoly in the shrimp processing machinery field by (1) charging Northwest shrimp canner lessees of this indispensable machinery double the rate charged Gulf Coast canners, and (2) selling the machinery to foreign canners while refusing to sell and merely leasing it to competing domestic canners.

An order halting those illegal discriminatory practices was issued by the FTC against the four former copartners of the New Orleans firm marketing the machinery. That company was liquidated late last year and the four copartners now are the officers and directors of two successor corporations.

The Commission said in its opinion written by Commissioner Everett MacIntyre that respondents' patented shrimp processing machinery includes peelers, cleaners, separators, deveiners, and graders. The principal piece of machinery and the one developed first is the peeler, which was offered to Gulf Coast shrimp canners in 1949. Prior to its advent the canners depended on hand labor for peeling or picking their shrimp. Four peeling machines can approximately equal the output of 250 to 300 laborers. Consequently the peeler immediately made hand picking obsolete and became an absolute necessity. Within less than 10 years all the Gulf Coast canners had installed and were using respondents' peelers.

Prior to 1956 all shrimp canneries (except a single plant in Georgia which ceased production in 1961) were located on the Gulf Coast. In the early 1950's com-

mercially exploitable quantities of pandalid shrimp (smaller and having less meat yield than the penaeid variety found off the Gulf Coast) were discovered off the coasts of Washington and Oregon. In 1956 the first canning plant was started at Westport, Wash., and respondents leased a peeler to it. By September 30, 1959, their machines were operating in 12 Northwest canneries. West Coast canners are charged double the rental rate assessed Gulf Coast lessees. The reason for the differential, the respondents stated, is that the smaller West Coast shrimp have a count per pound approximately twice that of the Gulf Coast variety and the higher rate was fixed "...in order to adhere to our basic policy of charging a rate which was in proportion to the labor saved."

Rejecting this, the Commission "found that respondents' avowed reason for their practices is not worthy of belief" and that their actual intent "was to protect and foster their own interests as shrimp canners by inhibiting the shrimp canners packing the pandalid shrimp of the Northwest. (The family of the peeling machine firms engages in shrimp canning through another corporate enterprise.)"

"The respondents' and other Gulf Coast canners' fear of the embryo Northwest shrimp manufacturing stems from two factors: the comparative low cost of pandalid shrimp and the static condition of the canned shrimp market. These factors convinced the respondents that unless defensive steps were taken the Gulf Coast shrimp industry would be unable to compete and would be eventually overpowered by the new competition from the Northwest."

Commissioner MacIntyre pointed out that several Northwest "canners who ceased canning shrimp entirely testified that they would have been able to continue operations and garner a reasonable profit had they been charged the same rates as those enjoyed by the Gulf canners. The statistical evidence completely supports this testimony, for in most cases the excess rental charged was substantially greater than the losses experienced."

"As we view it, respondents' conduct is completely undefensible. It constitutes a hasty, almost panicky, reaction to a new competitive threat. Their activities are shortsighted and economically self-defeating. The long-range interests of the shrimp canning industry in this country and of the economy as a whole lie in increased, rather than curtailed, competition. This industry is selling in a market which has remained static for four decades. While in recent years the lack of growth may be blamed to a certain extent upon the increasing popularity with the public of frozen shrimp products, this was not true for the entire period and does not constitute a complete explanation today. A principal reason for the static condition of this universe

is the complete failure of the producers to aggressively exploit their product by an aggressive program of consumer education. The money spent for advertising by the industry as a whole has been insignificant and this record indicates that an untapped market consisting of 76 percent of all American families is awaiting exploitation. If, as this record indicates, the supplies of shrimp in the Alaskan fishery are indeed unlimited, the potential for the Northwest shrimp canning industry directly and for the respondents indirectly through increased utilization of their machines is likewise unlimited.

"In view of all the foregoing facts and conclusions, it is the decision of this Commission that the respondents have engaged in unfair methods of competition and unfair acts or practices in commerce in violation of Section 5 of the Federal Trade Commission Act. The gravamen of the offense so found is the fixing and charging of higher discriminatory peeling machine rental rates to producers of canned shrimp located in the Northwestern United States with the result and effect of injuring and destroying competition between said Northwest canners and canners located in the Gulf and South Atlantic areas of the United States."

The Commission similarly held to be unlawful respondents' practice of refusing to sell their machinery to American canners while selling it to foreign competitors.

"Since the practice of selling shrimp processing machinery to foreigners is of comparatively recent origin, the full effects of the practice have yet to be felt by the domestic shrimp canning industry," Commissioner MacIntyre stated. "However, there is sufficient evidence in the record to support a finding that the probable effects of the practice will be to injure and seriously curtail the competitive abilities of domestic canners in two relevant markets: one consisting of the entire United States and the other the total of all foreign countries."

He pointed out that the "inevitable result of this practice is to maintain high production costs at home and to permit to foreigners lower production costs. The resulting imbalance of competitive ability can have no other effect than to make it increasingly difficult for our domestic producers to compete for foreign markets. On the other hand, we could reasonably expect that with lower peeling costs our domestic canners could expand their foreign sales. To impede or prevent such expansion is no less of an unfair practice or unreasonable restraint than to occasion a diminution in market position."

The Commission also noted that American sellers of shrimp "testified that competition from Japanese imports was becoming an increasingly serious factor in the domestic shrimp market. Apparently most canners in both the Northwestern United States and along the Gulf Coast are apprehensive with respect to this already serious competition and the almost inevitable probability that the present relative trickle of imported canned shrimp will increase to a flood. . . .

"The discomfiture of the American canners is understandable, for the respondents have placed them in an untenable position. They are required to operate with static higher peeling costs--costs which remain at a constant level without regard for production level. Foreign canners using machines purchased from respondents experience initial lower costs which recede

with increased production. American canners have been placed at a competitive disadvantage by respondents' foreign sales and the likelihood is that their foreign competitors, particularly the Japanese, will enlarge their penetration of the United States canned shrimp market. Domestic canners are powerless in the face of respondents' patent monopoly to effect any change in their competitive position vis-a-vis their foreign competitors using respondents' machines and the public interest requires remedial action on their behalf. Respondents' discriminatory practice of selling to some, but not all, competing canners has been shown by this record to be unfair and violative of Section 5 of the Federal Trade Commission Act."

On the other hand, the FTC dismissed the complaint as to the family's shrimp canning enterprise and the president of that firm.

Also dismissed were allegations in the complaint that respondents have utilized various unlawful means to gain, perpetuate, or extend a monopoly position in the shrimp processing machinery field, and that the family's shrimp canning firm and the individual respondents combined to adopt and carry out the alleged monopolistic practices.

Commissioner Philip Elman filed a separate opinion stating his views. He said, among other things, that due to respondents' discriminatory prices the "Northwest canners have been forced to the wall and may well be eliminated as a competitive factor in the shrimp canning industry."

"The short of it is that respondents' insistence on charging a monopoly price may well result in the destruction of a substantial segment of the shrimp canning industry. This result, which is not dictated by efficiency--for . . . the cost of processing shrimp by machine is the same regardless of the size of the shrimp--but by monopoly power, is clearly opposed to the objectives of antitrust policy. The right of a monopolist to exploit his monopoly (whether such monopoly is conferred by patents or otherwise) by charging a monopolist's discriminatory price does not, in my opinion, include the right to destroy or cripple a major segment of an industry, but must yield in such a case to the policy of competition embodied in the antitrust laws. . . . In the circumstances, respondents' refusal to treat the Northwest and the Gulf Coast shrimp canners on equal terms is an abuse of monopoly power. It has substantially and unjustifiably injured competition in the shrimp canning industry. It is therefore an unfair method of competition forbidden by Section 5."

However, continued Commissioner Elman, "So far as the charge relating to unlawful discrimination by respondents between foreign and domestic shrimp canners is concerned, I am compelled to dissent from the Commission's finding of violation. The record tells us altogether too little about the costs of foreign shrimp canners to justify an inference of competitive injury. Nor is it at all clear to what extent being able to purchase rather than lease respondents' shrimp processing machinery represents a net cost savings to the foreign canners."



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### AMENDMENT TO STANDARD OF IDENTITY FOR CANNED TUNA EFFECTIVE JUNE 15, 1964:

With reference to amending the standard of identity for canned tuna by listing sodium acid pyrophosphate as an optional ingredient for inhibiting the development of struvite crystals, notice was given on May 27, 1964, by the U. S. Food and Drug Administration, that no objections were filed to the order published in the Federal Register of April 16, 1964. Accordingly, the amendment promulgated by that order became effective on June 15, 1964. The Notice was published in the Federal Register of June 3, 1964.

An earlier Notice that a petition had been filed with the U. S. Food and Drug Administration proposing that the standard of identity for canned tuna be amended was published in the February 6, 1964, Federal Register. It invited all interested persons to submit their views regarding the proposal.

Note: See Commercial Fisheries Review, June 1964 p. 62.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### PROPOSED REVISED STANDARDS FOR GRADES OF FROZEN FISH BLOCKS:

Notice of proposed revised standards for grades of frozen fish blocks was published in the Federal Register, June 12, 1964, by the Department of the Interior in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended (7 U. S. C. 1621-1627). The proposed revised standards would be issued as an amendment to Part 263 of Title 50, Code of Federal Regulations, and would supersede the standards that have been in effect since July 1958.

The notice of proposed revised standards for grades of frozen fish blocks as it appeared in the Federal Register, June 12, 1964, follows:

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### [ 50 CFR PART 263 ]

#### FROZEN FISH BLOCKS

#### Proposed U.S. Standards for Grades

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e), it is proposed to amend five sections of Part 263 of Title 50, Code of Federal Regulations. The purpose of this amendment is to issue standards for grades of frozen fish blocks in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended (7 U.S.C. 1621-1627).

It is the policy of the Department of the Interior whenever practicable, to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Director, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington 25, D.C., within 30 days of the date of publication of this notice in the Federal Register.

STEWART L. UDALL,  
Secretary of the Interior.

JUNE 5, 1964.

*Second issue.* These standards will supersede the standards that have been in effect since July 1958.

#### § 263.1 Description of the product.

Frozen fish blocks are rectangular-shaped masses of cohering frozen fish flesh of a single species. They consist of adequately drained whole, wholesome fillets or pieces of whole, wholesome fillets cut into small portions but not ground or comminuted; and they are frozen and maintained at temperatures necessary for the preservation of the product. Frozen fish blocks are made in two styles.

(a) *Style I—skinless fish blocks.* Fish blocks that have been made from skinless fillets.

(b) *Style II—skin-on fish blocks.* Fish blocks that have been made from demonstrably acceptable skin-on fillets.

#### § 263.2 Grades of frozen fish blocks.

(a) "U.S. Grade A" is the quality of frozen fish blocks that (1) possess a good flavor and odor and that (2) have a total score of 85 to 100 points for those factors that are rated in accordance with the scoring system outlined in this part.

(b) "U.S. Grade B" is the quality of frozen fish blocks that (1) possess at least a reasonably good flavor and odor and that (2) have a total score of 70 to 84 points for those factors that are rated in accordance with the scoring system in this part.

(c) "Substandard" is the quality of frozen fish blocks that meet product description but fail to meet the requirements of U.S. Grade B.

#### § 263.11 Determination of the grade.

The grade is determined by examining the product in the frozen, thawed, and

TABLE I—SCHEDULE OF POINT DEDUCTIONS PER SAMPLE UNIT

State	No.	Factors scored	Aspects determining score	Deduct
Frozen	1	Color.....	Small degree: Moderate yellowing..... Large degree: Excessive yellowing and/or rusting.....	4 16
	2	Dehydration.....	Minor: Moderate dehydration for each 10 percent of surface area affected. Major: Excessive dehydration for each 10 percent of surface area affected.	3 6
	3	Uniformity of size.....	Minor: Each deviation from declared size in length, width, or thickness $\pm 1/4$ inch. Major: Each deviation from declared size in length, width, or thickness over $\pm 1/4$ inch.	3 6
	4	Uniformity of weight.....	Minor: Any minus deviation from declared weight of more than 1 ounce but not more than 4 ounces. Major: Any minus deviation from declared weight more than 4 ounces.	3 6
	5	Angles.....	Edge angle—2 out of 3 readings deviating $3/4$ inch. Corner angle—each angle deviating $3/4$ inch.	2
	6	Improper fill.....	For each 1 ounce unit from the block that would be adversely affected due to air space, ice spaces, depressions, ragged edges, damage, or imbedded packaging material.	1
Thawed	7	Blemishes.....	Each blemish in 5 pounds of fish block.....	2
	8	Bones.....	Each instance of bones in 5 pounds of fish block.....	5
Cooked	9	Texture.....	Small Degree: Moderately tough, dry, rubbery, or mushy..... Large Degree: Excessively tough, dry, rubbery, or mushy.....	5 16

cooked states and is evaluated by considering the following factors:

(a) *Factors rated by score points.* Points are deducted for variation in the quality of each factor in accordance with the schedule in table 1. The total of points deducted is subtracted from 100 to obtain the score. The maximum score is 100; the minimum score is 0.

(b) *Factors not rated by score points.* The factor of "flavor and odor" is evaluated organoleptically by smelling and tasting the product after it has been cooked in accordance with § 263.25.

(1) Good flavor and odor (essential requirements for a Grade A product) means that the cooked product has the typical flavor and odor of the indicated species of fish and is free from rancidity, bitterness, staleness, and off-flavors and off-odors of any kind.

(2) Reasonably good flavor and odor (minimum requirements of a Grade B product) means that the cooked product is lacking in good flavor and odor but is free from objectionable off-flavors and off-odors of any kind.

#### § 263.21 Definitions.

(a) *Examination of sample, frozen state.* (1) Color refers to reasonably uniform color characteristic of the species used. Deviations from normal color include noticeable yellowing and/or rusting of the fish surface.

(2) Dehydration refers to loss of moisture from the fish surfaces during frozen storage. Moderate dehydration is color-masking and can easily be scraped off with a fingernail. Excessive dehydration is deep color-masking and requires a knife or other hand instrument to scrape it off.

(3) Uniformity of size refers to the degree of conformity to the declared size. A deviation is considered to be any deviation from stated length, width or thickness, or from the average dimensions if no dimensions are stated. Only one de-

viation from each dimension may be assessed. Two readings for length, three readings for width, and four readings for thickness will be measured.

(4) Uniformity of weight refers to the degree of conformity to the weight. Only underweight deviations are assessed.

(5) An acceptable edge angle is an angle formed by two adjoining surfaces whose apex is within  $3/4$  inch of a carpenter's square placed along the surfaces. For each edge angle, three readings will be made and at least two readings must be acceptable for the whole edge angle to be acceptable. An acceptable corner angle is an angle formed by 3 adjoining surfaces whose apex is within  $3/4$  inch of the apex of a carpenter's square placed on the edge surfaces. Unacceptable angles fail to meet these criteria.

(6) Improper fill refers to surface and internal air or ice voids, ragged edges, or damage. It is measured as the number of 1-ounce units that would be adversely affected when the block is cut. For this purpose, the 1-ounce unit is considered to be  $4 \times 1 \times 1/2$  inch.

(b) *Examination of the product, thawed state.* (1) Blemishes refer to a piece of skin, scale, a blood spot, a fin, a bruise, a black belly lining, a piece of nape membrane or a harmless piece of extraneous material. One "piece of skin" consists of one piece  $1/2$  square inch in area; except that for skin patches larger than 1 square inch, an additional instance shall be assessed for each additional  $1/2$  square inch in area. "Blood spot" is one of such size and degree as to be considered objectionable. A "piece of black belly lining" is any piece longer than  $1/2$  inch. "Fin" is one fin or one identifiable part of a fin. A piece of nape membrane consists of one piece  $1/2$  square inch in area or larger. "Scales" are aggregates of one or more scales of such degree as to be considered objectionable. Skin is not to be considered a blemish

on Style II block. Blemishes are measured on a 5-pound portion cut from the edge of the fish block and thawed.

(2) "Bones" refers to any potentially harmful bones in the fish block. A potentially harmful bone is one that after being cooked is capable of piercing or hurting the palate. One instance of bones means one bone or group of bones occupying or contacting a circular area of 1 square inch. Bones are measured on the same 5-pound thawed portion cut from the fish block.

(c) *Examination of the cooked product.* (1) Heating in a suitable manner means heating the product in one of two ways, as follows:

(i) Cut three or more portions about 4 by 3 by  $1/2$  inches from a frozen block. Wrap them individually or in a single layer in aluminum foil. Place the package portions on a wire rack suspended over boiling water in a covered container. Steam the packaged portions until the product is thoroughly heated, or

(ii) Cut and package the portions as previously described. Place the packaged portions on a flat cookie sheet or shallow flat-bottom pan of sufficient size so that the packages can be evenly spread on the sheet or pan. Place the pan and frozen contents in a properly ventilated oven heated to 400° F. and remove when the product is thoroughly heated.

(2) Texture refers to the condition of the cooked fish flesh. The texture should be firm, slightly resilient, but not tough or rubbery; and should be moist, but not mushy. Deductions for texture will follow the deductions assessed in table 1.

(3) Flavor and odor is evaluated organoleptically as described in § 263.11(b).

(4) *General definitions.* (1) "Demonstrably acceptable" shall mean that the product has been produced commercially and met customer acceptance. (2) "Adversely affected" shall mean that the unit cut would deviate more than 15 percent plus or minus from 1 ounce.

(3) "Small" (overall assessment) refers to a condition that is noticeable, but is not seriously objectionable.

(4) "Large" (overall assessment) refers to a condition that is not only noticeable, but is seriously objectionable.

(5) "Minor" (measured quantity or area) refers to a defect that affects the appearance or utility of the product or both.

(6) "Major" (measured quantity or area) refers to a defect that seriously affects the appearance or utility of the product or both.

#### § 263.25 Tolerances for certification of officially drawn samples.

The sample rates and grades of specific lots shall be certified on the basis of the regulations governing inspection and certification of processed fishery products, processed products thereof, and certain other processed food products.

### WHALING REGULATIONS AMENDED:

The regulations of the International Whaling Commission as amended October 9, 1963, were published in the Federal Register, June 16, 1964, to amend and succeed Part 351--Whaling, Code of Federal Regulations, Title 50--Wildlife and Fisheries. The revised regulations became effective on publication in the Federal Register. The only changes relating to current United States commercial whaling operations are the provisions providing for certain exceptions in the minimum length of blue, sei, and fin whales which can be landed at land stations in the Northeast Pacific area.

The new regulations as they appeared in the Federal Register, June 16, 1964, follow:

## Title 50--WILDLIFE AND FISHERIES

### Chapter III--International Regulatory Agencies (Fishing and Whaling)

#### SUBCHAPTER B--INTERNATIONAL WHALING COMMISSION

#### PART 351--WHALING

Section 13 of the Whaling Convention Act of 1949 (64 Stat. 425; 16 U.S.C. 916k), the legislation implementing the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946, by the United States of America and certain other Governments, provides that regulations of the International Whaling Commission shall be submitted for publication in the FEDERAL REGISTER by the Secretary of the Interior. Regulations of the Commission are defined to mean the whaling regulations in the schedule annexed to and constituting a part of the Convention in their original form or as modified, revised, or amended by the Commission. The provisions of the whaling regulations, as originally embodied in the schedule annexed to the Convention, have been amended several times by the International Whaling Commission, the last amendments having been brought into effect on October 9, 1963. The provisions of these regulations are applicable to nationals and whaling enterprises of the United States. The only change relating to current United States commercial whaling operations is that found in § 351.9 (a) and (b), providing for certain exceptions in the minimum length of blue, sei, and fin whales which can be landed at land stations in the Northeast Pacific area. These changes allow the taking of blue whales not less than 65 feet, sei whales not less than 35 feet, and fin whales not less than 50 feet for delivery to land stations in the Northeast Pacific area without regard to their use as human or animal food for local consumption for a period of three years starting April 1, 1962.

Amendments to the whaling regulations are adopted by the International

Whaling Commission pursuant to Article V of the Convention without regard to the notice and public procedure requirements of the Administrative Procedure Act (5 U.S.C. 1001). Accordingly, in fulfillment of the duty imposed upon the Secretary of the Interior by section 13 of the Whaling Convention Act of 1949, the whaling regulations published as Part 351, Title 50, Code of Federal Regulations, as the same appeared in 25 F.R. 8465, September 1, 1960, are amended and republished to read as hereinafter set forth.

Regulations of the Department of the Interior, implementing the Whaling Convention Act of 1949, are set forth in 50 CFR Part 230--Whaling.

These regulations shall become effective upon the date of publication in the FEDERAL REGISTER.

- Sec.
- 351.1 Inspection.
  - 351.2 Killing of gray or right whales prohibited.
  - 351.3 Killing of calves or suckling whales prohibited.
  - 351.4 Operation of factory ships limited.
  - 351.5 Closed area for factory ships in Antarctic.
  - 351.6 Limitations on the taking of humpback whales.
  - 351.7 Closed seasons for pelagic whaling for baleen and sperm whales.
  - 351.8 Catch quota for baleen whales.
  - 351.9 Minimum size limits.
  - 351.10 Closed seasons for land stations.
  - 351.11 Use of factory ships in waters other than south of 40° South Latitude.
  - 351.12 Limitations on processing of whales.
  - 351.13 Prompt processing required.
  - 351.14 Remuneration of employees.
  - 351.15 Submission of laws and regulations.
  - 351.16 Submission of statistical data.
  - 351.17 Factory ship operations within territorial waters.
  - 351.18 Definitions.

**AUTHORITY:** The provisions of this Part 351 issued under Article V, 62 Stat. 1718. Interpret or apply secs. 2-14, 64 Stat. 421-425; 16 U.S.C. 916 et seq.

#### § 351.1 Inspection.

(a) There shall be maintained on each factory ship at least two inspectors of whaling for the purpose of maintaining twenty-four hour inspection and also such observers as the member countries engaged in the Antarctic pelagic whaling may arrange to place on each other's factory ships. These inspectors shall be appointed and paid by the Government having jurisdiction over the factory ship: *Provided*, That inspectors need not be appointed to ships which, apart from the storage of products, are used during the season solely for freezing or salting the meat and entrails of whales intended for human food or for the feeding of animals.

(b) Adequate inspection shall be maintained at each land station. The inspectors serving at each land station shall be appointed and paid by the Government having jurisdiction over the land station.

#### § 351.2 Killing of gray or right whales prohibited.

It is forbidden to take or kill gray whales or right whales, except when the meat and products of such whales are to be used exclusively for local consumption by the aborigines.



### § 351.3 Killing of calves or suckling whales prohibited.

It is forbidden to take or kill calves or suckling whales or female whales which are accompanied by calves or suckling whales.

### § 351.4 Operation of factory ships limited.

(a) It is forbidden to kill blue whales in the North Atlantic Ocean for five years ending on February 24, 1965.

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales in any of the following areas:

(1) In the waters north of 66° North Latitude except that from 150° East Longitude eastwards as far as 140° West Longitude the taking or killing of baleen whales by a factory ship or whale catcher shall be permitted between 66° North Latitude and 72° North Latitude;

(2) In the Atlantic Ocean and its dependent waters north of 40° South Latitude;

(3) In the Pacific Ocean and its dependent waters east of 150° West Longitude between 40° South Latitude and 35° North Latitude;

(4) In the Pacific Ocean and its dependent waters west of 150° West Longitude between 40° South Latitude and 20° North Latitude;

(5) In the Indian Ocean and its dependent waters north of 40° South Latitude.

### § 351.5 Closed area for factory ships in Antarctic.

It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales in the waters south of 40° South Latitude from 70° West Longitude westward as far as 160° West Longitude. (This paragraph as a result of a decision of the fourteenth meeting was rendered inoperative until the Commission otherwise decides.)

### § 351.6 Limitations on the taking of humpback whales.

(a) It is forbidden to kill or attempt to kill humpback whales in the North Atlantic Ocean for a period ending on November 8, 1964. Notwithstanding this closed season, the taking of 10 humpback whales per year is permitted in Greenland waters provided that whale catchers of less than 50 gross register tonnage are used for this purpose.

(b) It is forbidden to kill or attempt to kill humpback whales in the waters south of the equator.

(c) It is forbidden to kill or attempt to kill blue whales in the waters south of 40° South Latitude, except in the waters north of 55° South Latitude from 0° eastwards to 80° East Longitude.

### § 351.7 Closed seasons for pelagic whaling for baleen and sperm whales.

(a) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales (excluding minke whales) in any waters south of 40° South Latitude, except during the period from December 12 to April 7, following, both days inclusive; and no such whale catcher shall be used for the purpose of

killing or attempting to kill blue whales before February 14 in any year.<sup>1</sup>

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill sperm or minke whales, except as permitted by the Contracting Governments in accordance with paragraphs (c), (d), and (e) of this section.

(c) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction, one continuous open season not to exceed eight months out of any period of twelve months during which the taking or killing of sperm whales by whale catchers may be permitted: *Provided*, That a separate open season may be declared for each factory ship and the whale catchers attached thereto.

(d) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by the whale catchers may be permitted: *Provided*, That:

(1) A separate open season may be declared for each factory ship and the whale catchers attached thereto;

(2) The open season need not necessarily include the whole or any part of the period declared for other baleen whales pursuant to paragraph (a) of this section.

(e) Each Contracting Government shall declare for all whale catchers under its jurisdiction not operating in conjunction with a factory ship or land station one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by such whale catchers may be permitted. Notwithstanding this paragraph, one continuous open season not to exceed eight months may be implemented so far as Greenland is concerned.

### § 351.8 Catch quota for baleen whales.

The number of baleen whales taken during the open season caught in waters south of 40° South Latitude by whale catchers attached to factory ships under the jurisdiction of the Contracting Governments shall not exceed ten thousand blue whale units in 1963/64.

(b) For the purposes of paragraph (a) of this section, blue whale units shall be calculated on the basis that one blue whale equals:

(1) Two fin whales or

(2) Two and a half humpback whales or

(3) Six seal whales.

(c) Notification shall be given in accordance with the provisions of Article VII of the Convention, within two days after the end of each calendar week, of data on the number of blue whale units

taken in any waters south of 40° South Latitude by all whale catchers attached to factory ships under the jurisdiction of each Contracting Government: *Provided*, That when the number of blue whale units is deemed by the Bureau of International Whaling Statistics to have reached 9,000, notification shall be given as aforesaid at the end of each day of data on the number of blue whale units taken.

(d) If it appears that the maximum catch of whales permitted by paragraph (a) of this section may be reached before April 7 of any year, the Bureau of International Whaling Statistics shall determine, on the basis of the data provided, the date on which the maximum catch of whales shall be deemed to have been reached and shall notify the master of each factory ship and each Contracting Government of that date not less than four days in advance thereof. The killing or attempting to kill baleen whales by whale catchers attached to factory ships shall be illegal in any waters south of 40° South Latitude after midnight of the date so determined.

(e) Notification shall be given in accordance with the provisions of Article VII of the Convention of each factory ship intending to engage in whaling operations in any waters south of 40° South Latitude.<sup>2</sup>

### § 351.9 Minimum size limits.

(a) It is forbidden to take or kill any blue, sei or humpback whales below the following lengths:

Blue whales 70 feet (21.3 metres),  
Sei whales 40 feet (12.2 metres),  
Humpback whales 35 feet (10.7 metres),

except that blue whales of not less than 65 feet (19.8 metres) and sei whales of not less than 35 feet (10.7 metres) in length may be taken for delivery to land stations, provided that, except in the Northeast Pacific area for a period of three years starting 1 April 1962, the meat of such whales is to be used for local consumption as human or animal food.

(b) It is forbidden to take or kill any fin whales below 57 feet (17.4 metres) in length for delivery to factory ships or land stations in the Southern Hemisphere, and it is forbidden to take or kill fin whales below 55 feet (16.8 metres) for delivery to factory ships or land stations in the Northern Hemisphere; except that fin whales of not less than 55 feet (16.8 metres) may be taken for delivery to land stations in the Southern Hemisphere and fin whales of not less than 50 feet (15.2 metres) may be taken for delivery to land stations in the Northern Hemisphere provided that, except in the Northeast Pacific area for a period of three years starting 1 April 1962, in each case, the meat of such whales is to be used for local consumption as human or animal food.

(c) It is forbidden to take or kill any sperm whales below 38 feet (11.6 metres) in length, except that sperm whales of not less than 35 feet (10.7 metres) in length may be taken for delivery to land stations.

<sup>1</sup> Section 357.8(e) in earlier copies was deleted by the Commission at its fourth meeting in 1962 and the deletion became effective on September 12, 1962. Original paragraph (f) consequently becomes paragraph (e).

<sup>2</sup> The amendment of § 351.7(a) of the starting date of the blue whale season from February 1 to February 14 was objected to within the prescribed period by the Governments of Japan, the Netherlands, Norway, the United Kingdom and the Union of Soviet Socialist Republics. The objections were not withdrawn and the amendment came into force on January 28, 1961 but is not binding upon Japan, the Netherlands, Norway, the United Kingdom and the Union of Soviet Socialist Republics.

(d) Whales must be measured when at rest on deck or platform, as accurately as possible by means of a steel tape measure fitted at the zero end with a spiked handle which can be stuck into the deck planking abreast of one end of the whale. The tape measure shall be stretched in a straight line parallel with the whale's body and read abreast the other end of the whale. The ends of the whale, for measurement purposes, shall be the point of the upper jaw and the notch between the tail flukes. Measurements, after being accurately read on the tape measure, shall be logged to the nearest foot, that is to say, any whale between 75 feet 6 inches and 76 feet 6 inches shall be logged as 76 feet, and any whale between 76 feet 6 inches and 77 feet 6 inches shall be logged as 77 feet. The measurement of any whale which falls on an exact half foot shall be logged as the next half foot, e.g., 76 feet 6 inches precisely shall be logged as 77 feet.

#### § 351.10 Closed seasons for land stations.

(a) It is forbidden to use a whale catcher attached to a land station for the purpose of killing or attempting to kill baleen and sperm whales except as permitted by the Contracting Government in accordance with paragraphs (b), (c), and (d) of this section.

(b) Each Contracting Government shall declare for all land stations under its jurisdiction, and for whale catchers attached to such land stations, one open season during which the taking or killing of baleen (excluding minke) whales by the whale catchers shall be permitted. Such open season shall be for a period of not more than six consecutive months in any period of twelve months and shall apply to all land stations under the jurisdiction of the Contracting Government: *Provided*, That a separate open season may be declared for any land station used for the taking or treating of baleen (excluding minke) whales which is more than 1,000 miles from the nearest land station used for the taking or treating of baleen (excluding minke) whales under the jurisdiction of the same Contracting Government.

(c) Each Contracting Government shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations, one open season not to exceed eight continuous months in any period of twelve months during which the taking or killing of sperm whales by the whale catchers shall be permitted, such period of eight months to include the whole of the period of six months declared for baleen whales (excluding minke whales) as provided for in paragraph (b) of this section: *Provided*, That a separate open season may be declared for any land station used for the taking or treating of sperm whales which is more than 1,000 miles from the nearest land station used for the taking or treating of sperm whales under the jurisdiction of the same Contracting Government.<sup>2</sup>

(d) (1) Each Contracting Government shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations one open season not to exceed six continuous months in any period of twelve months during which the taking or killing of minke whales by the whale catchers shall be permitted (such period not being necessarily concurrent with the period declared for other baleen whales, as provided for in paragraph (b) of this section): *Provided*, That a separate open season may be declared for any land station used for the taking or treating of minke whales which is more than 1,000 miles from the nearest land station used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government.

(2) Except that a separate open season may be declared for any land station used for the taking or treating of minke whales which is located in an area having oceanographic conditions clearly distinguishable from those of the area in which are located the other land stations used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government; but the declaration of a separate open season by virtue of the provisions of this paragraph shall not cause thereby the period of time covering the open seasons declared by the same Contracting Government to exceed nine continuous months of any twelve months.

(e) The prohibitions contained in this section shall apply to all land stations as defined in Article II of the Whaling Convention of 1946 and to all factory ships which are subject to the regulations governing the operation of land stations under the provisions of § 351.17.

#### § 351.11 Use of factory ships in waters other than south of 40° South Latitude.

It is forbidden to use a factory ship which has been used during a season in any waters south of 40° South Latitude for the purpose of treating baleen whales, in any other area for the same purpose within a period of one year from the termination of that season: *Provided*, That this paragraph shall not apply to a ship which has been used during the season solely for freezing or salting the meat and entrails of whales intended for human food or feeding animals.

#### § 351.12 Limitations on processing of whales.

(a) It is forbidden to use a factory ship or a land station for the purpose of treating any whales (whether or not killed by whale catchers under the jurisdiction of a Contracting Government) the killing of which by whale catchers under the jurisdiction of a Contracting Government is prohibited by the provisions of §§ 351.2, 351.4, 351.5, 351.6, 351.7, 351.8, or § 351.10.

(b) All other whales (except minke whales) taken shall be delivered to the factory ship or land station and all parts of such whales shall be processed by boiling or otherwise, except the internal organs, whale bone and flippers of all whales, the meat of sperm whales and of parts of whales intended for human food or feeding animals. A Contracting Government may in less developed regions exceptionally permit treating of whales

without use of land stations provided that such whales are fully utilized in accordance with this paragraph.

(c) Complete treatment of the carcasses of "Dauwal" and of whales used as feeders will not be required in cases where the meat or bone of such whales is in bad condition.

#### § 351.13 Prompt processing required.

(a) The taking of whales for delivery to a factory ship shall be so regulated or restricted by the master or person in charge of the factory ship that no whale carcass (except of a whale used as a feeder, which shall be processed as soon as is reasonably practicable) shall remain in the sea for a longer period than thirty-three hours from the time of killing to the time when it is hauled up for treatment.

(b) Whales taken by all whale catchers, whether for factory ships or land stations, shall be clearly marked so as to identify the catcher and to indicate the order of catching.

(c) All whale catchers operating in conjunction with a factory ship shall report by radio to the factory ship:

(1) The time when each whale is taken

(2) Its species, and

(3) Its marking effected pursuant to paragraph (b) of this section.

(d) The information reported by radio pursuant to paragraph (c) of this section shall be entered immediately in a permanent record which shall be available at all times for examination by the whaling inspectors; and in addition there shall be entered such permanent record the following information as soon as it becomes available:

(1) Time of hauling up for treatment,

(2) Length, measured pursuant to paragraph (d) of § 351.9,

(3) Sex,

(4) If female, whether milk-filled or lactating,

(5) Length and sex of foetus, if present, and

(6) A full explanation of each infraction.

(e) A record similar to that described in paragraph (d) of this section shall be maintained by land stations, and all of the information mentioned in the said paragraph shall be entered therein as soon as available.

#### § 351.14 Remuneration of employees.

Gunnors and crews of factory ships, land stations, and whale catchers shall be engaged on such terms that their remuneration shall depend to a considerable extent upon such factors as the species, size and yield of whales taken and not merely upon the number of the whales taken. No bonus or other remuneration shall be paid to the gunnors or crews of whale catchers in respect to the taking of milk-filled or lactating whales.

#### § 351.15 Submission of laws and regulations.

Copies of all official laws and regulations relating to whales and whaling and changes in such laws and regulations shall be transmitted to the Commission.

#### § 351.16 Submission of statistical data.

Notification shall be given in accordance with the provisions of Article VII

<sup>2</sup> Section 351.10(c) came into force as from February 21, 1962, in respect to all Contracting Governments, except the Commonwealth of Australia, which lodged an objection to it within the prescribed period, and this objection was not withdrawn. The provisions of this paragraph are not, therefore, binding on the Commonwealth of Australia.

of the Convention with regard to all factory ships and land stations of statistical information (a) concerning the number of whales of each species taken, the number thereof lost, and the number treated at each factory ship or land station, and (b) as to the aggregate amounts of oil of each grade and quantities of meal, fertilizer (guano), and other products derived from them, together with (c) particulars with respect to each whale treated in the factory ship or land station as to the date and approximate latitude and longitude of taking, the species and sex of the whale, its length and, if it contains a fetus, the length and sex, if ascertainable, of the fetus. The data referred to in paragraphs (a) and (c) of this section shall be verified at the time of the tally and there shall also be notification to the Commission of any information which may be collected or obtained concerning the calving grounds and migration routes of whales. In communicating this information, there shall be specified:

- (1) The name and gross tonnage of each factory ship;
- (2) The number of whale catchers, including separate totals for surface vessels and aircraft and specifying, in the case of surface vessels, the average length and horsepower of whale catchers;
- (3) A list of the land stations which were in operation during the period concerned.

#### § 351.17 Factory-ship operations within territorial waters.

(a) A factory ship which operates solely within territorial waters in one of the areas specified in paragraph (c) of this section, by permission of the Government having jurisdiction over those waters, and which flies the flag of that Government shall, while so operating, be subject to the regulations governing the operation of land stations and not to the regulations governing the operation of factory ships.

(b) Such factory ship shall not, within a period of one year from the termination

\*Section 351.17 (a), (b), and (c) (1) to (3), was inserted by the Commission at its first meeting in 1949, and came into force on January 11, 1950, as regards all Contracting Governments except France, which

of the season in which she so operated, be used for the purpose of treating baleen whales in any of the other areas specified in paragraph (c) of this section or south of 40° South Latitude.

(c) The areas referred to in paragraphs (a) and (b) of this section are:

- (1) On the coast of Madagascar and its dependencies;
- (2) On the west coasts of French Africa;
- (3) On the coasts of Australia, namely on the whole east coast and on the west coast in the area known as Shark Bay and northward to Northwest Cape and including Exmouth Gulf and King George's Sound, including the port of Albany;
- (4) On the Pacific coast of the United States of America between 35° North Latitude and 49° North Latitude.

#### § 351.18 Definitions.

(a) The following expressions have the meanings respectively assigned to them, that is to say:

"Baleen whale" means any whale which has baleen or whale bone in the mouth, i.e., any whale other than a toothed whale.

"Blue whale" (*Balaenoptera or Sibbaldus musculus*) means any whale known by the name of blue whale, Sibbald's orca, or sulphur bottom.

"Dauhvai" means any unclaimed dead whale found floating.

"Fin whale" (*Balaenoptera physalus*) means any whale known by the name of common finback, common orca, finback, finner, fin whale, herring whale, razorback, or true fin whale.

"Gray whale" (*Rhachianectes glaucus*) means any whale known by the name of gray whale, California gray, devil fish, hard head, mussel digger, gray back or rip sack.

therefore remain bound by the provisions of the original § 351.17, which reads as follows: "§ 351.17 Notwithstanding the definition of land station contained in Article II of the Convention, a factory ship operating under the jurisdiction of a Contracting Government, and the movements of which are confined solely to the territorial waters of that Government, shall be subject to the regulations governing the operation of land sta-

"Humpback whale" (*Megaptera nodosa* or *novaeangliae*) means any whale known by the name of bunch, humpback, humpback whale, humpbacked whale, hump whale or hunchbacked whale.

"Minke whale" (*Balaenoptera acutorostrata*, B. Davidson, B. buttoni) means any whale known by the name of lesser orca, little piked whale, minke whale, pike-headed whale or sharp-headed finner.

"Right whale" (*Balaena mysticetus*; *Eubalaena glacialis*, *E. australis*, etc.; *Neobalaena marginata*) means any whale known by the name of Atlantic right whale, Arctic right whale, Biscayan right whale, bowhead, great polar whale, Greenland right whale, Greenland whale, Nordkaper, North Atlantic right whale, North Cape whale, Pacific right whale, pigmy right whale, Southern pigmy right whale, or Southern right whale.

"Sei whale" (*Balaenoptera borealis*) means any whale known by the name of sei whale, Rudolphi's orca, pollack whale, or coalfish whale and shall be taken to include Bryde's whale (*B. brydei*).

"Sperm whale" (*Physeter catodon*) means any whale known by the name of sperm whale, spermacet whale, cachalot or pot whale.

"Toothed whale" means any whale which has teeth in the jaws.

(b) "Whales taken" means whales that have been killed and either flagged or made fast to catchers.

STEWART L. UNALL,  
Secretary of the Interior.

JUNE 9, 1964.

tions within the following areas: (a) On the coast of Madagascar and its dependencies, and on the west coasts of French Africa; (b) on the west coast of Australia in the area known as Shark Bay and northward to Northwest Cape and including Exmouth Gulf and King George's Sound, including the Port of Albany; and on the east coast of Australia, in Twofold Bay and Jervis Bay."

Section 351.17 (c) (4) was inserted by the Commission at its eleventh meeting in 1959 and came into force on October 5, 1959 as regards all Contracting Governments.

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#### BUREAU OF COMMERCIAL FISHERIES

### ALASKA DISASTER RELIEF--CHARTER VESSEL LOAN REGULATIONS:

Loans to commercial fishermen for the purpose of chartering fishing vessels pending the construction or repair of vessels lost, destroyed, or damaged by the Alaska earthquake of March 27, 1964, and subsequent tidal waves related thereto are authorized to be made by the Secretary of the Interior by Section 9 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309), approved May 20, 1964.

New regulations (became effective on publication) implementing such authorization were

published in the Federal Register, May 23, 1964, as follows:

## Title 50--WILDLIFE AND FISHERIES

### Chapter II--Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER F--AID TO FISHERIES

#### PART 251--CHARTER LOAN PROCEDURES

Section 9 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309), approved on May 20, 1964, authorized the Secretary of the Interior, under such terms and conditions and pursuant to regulations pre-

scribed by him, to make loans to commercial fishermen for the purpose of chartering fishing vessels pending the construction or repair of vessels lost, destroyed or damaged by the earthquake of March 27, 1964, and subsequent tidal waves related thereto. These loans must be made promptly if they are to be of use during the coming fishing season. As these regulations do not provide penalties to the general public and will assist persons qualifying to obtain financial assistance, they will be adopted without the customary notice of proposed rule making. To implement the authorization granted in section 9 of the above-mentioned Act, the following regulations, constituting a new Part under Subchapter F, are adopted and become effective at the beginning of the calendar day on which they are published in the FEDERAL REGISTER.

Sec.	Definition of terms.
251.2	Purpose.
251.3	Interpretation of loan authorization.
251.4	Qualified loan applicants.
251.5	Basic limitations.
251.6	Use of loan funds.
251.7	Repayment.
251.8	Applications.
251.9	Processing of applications.
251.10	Approval of loans.
251.11	Interest.
251.12	Maturity.
251.13	Security.
251.14	Books, records and reports.
251.15	Insurance required.
251.16	Disclaimer.
251.17	Penalties on default.

**AUTHORITY:** The provisions of this Part 251 issued under sec. 4, 70 Stat. 1121; 16 U.S.C. 742c and Public Law 88-309.

#### § 251.1 Definition of terms.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *Secretary*. The Secretary of the Interior or his authorized representative.

(b) *Commercial fisherman*. An individual, partnership or corporation that owned and operated a vessel engaged in catching fish or shellfish during 1963, which vessel was lost, destroyed or damaged in the earthquake of March 27, 1964, and subsequent tidal waves related thereto.

(c) *Charter*. Charter means a bareboat or demise charter, the terms and provisions of which shall be satisfactory to the Secretary.

#### § 251.2 Purpose.

The purpose of section 9 of the Commercial Fisheries Research and Development Act of 1964 (the Act) is to offer immediate assistance in the restoration of the fishing fleet which was severely damaged by the earthquake of March 27, 1964, and subsequent tidal waves related thereto. This assistance will consist of short-term loans to enable fishermen, pending the construction or repair of fishing assistance which was severely damaged as a result of such catastrophe, to bareboat charter vessels for fishing.

#### § 251.3 Interpretation of loan authorization.

The terms used in the Act to describe the purposes for which loans may be granted are construed to be limited to the meanings ascribed in this section.

(a) Chartering fishing vessels: The words "chartering fishing vessels" mean the making of bareboat charters for such

time as may be required, for operations in the fishery in which the applicant was engaged during 1963, until the damaged vessel can be repaired or the lost or destroyed vessel replaced.

(b) Net profits of the operations of such chartered vessels: The words "net profits of the operations of such chartered vessels" mean the net profits computed in accordance with generally accepted accounting practices with due regard to the customs and usage in the locality in which the fishing operation is conducted.

(c) Such reasonable amount as determined by the Secretary for the salary of the fishermen chartering such vessels. The words "such reasonable amount as determined by the Secretary for the salary of the fishermen chartering such vessels" mean the average income of the borrower from operations of the damaged, destroyed or lost vessel during the calendar years 1961, 1962, and 1963, with a maximum of \$4,000 per annum, computed from borrower's income tax returns for said years.

(d) All terms used in Section 4 of the Fish and Wildlife Act of 1956, as amended, applicable hereto shall be as defined in Part 250 of this subchapter. In the event of an inconsistency between the provisions of Part 250 of this subchapter and this Part 251, the latter shall control.

#### § 251.4 Qualified loan applicants.

Any citizen of the United States meeting the criteria of this section may be considered a qualified loan applicant.

(a) Any commercial fisherman having a vessel, damaged during the aforementioned earthquake and the subsequent tidal waves related thereto, repaired and such repairs cannot be completed in time to commence fishing operations.

(b) Any commercial fisherman having a vessel, lost or destroyed, whether actually or constructively, during the aforesaid earthquake and tidal waves, replaced and such replacement cannot be obtained in time to commence fishing operations.

(c) Proof of loss, destruction or damage to the vessel and evidence of pending replacement or repair thereof must be furnished to the Secretary at the time the application for the loan is filed.

#### § 251.5 Basic limitations.

The basic limitations shall be the same as in § 250.5 of this subchapter.

#### § 251.6 Use of loan funds.

The use of the loan funds are restricted to the payment of charter hire when due, until which time the Secretary will hold any balance of funds in escrow. Charter hire is construed to include delivery and redelivery of the vessel.

#### § 251.7 Repayment.

Repayment shall be made on or before the maturity date of the note, executed in connection with the loan and, subject to the proviso set forth herein, be required only from the net profits of the operations of the chartered vessel reduced by and in the manner set forth in § 251.3(c). If the aforesaid net profit as so reduced is not equal to the amount of loan repayment due, the amount of such net profit shall be applied in full satisfaction of the note; provided, however, that if the borrower fails to replace

or repair, as the case may be, the lost, destroyed or damaged vessel, to the satisfaction of the Secretary, then the interest rate on the loan shall be 5 percent, computed from the date of the execution of the note, and the entire amount of the note shall be due and payable at maturity without respect to net profit.

#### § 251.8 Application.

Any citizen desiring a loan under this part shall make application to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D.C., 20240, on a loan application form furnished by the Bureau, except that in the discretion of the Secretary, an application may be made on other than the prescribed form may be considered if the application contains information deemed to be sufficient.

#### § 251.9 Processing of applications.

Applications shall be processed as in § 250.7 of this subchapter.

#### § 251.10 Approval of loans.

The approval of loans shall be in the same manner as is set forth in § 250.8 of this subchapter.

#### § 251.11 Interest.

The rate of interest on all loans which may be charged under the Act (subsection 4(e) of the Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742c)) is fixed at three percent (3%) per annum, except as otherwise provided in § 251.7.

#### § 251.12 Maturity.

The period of maturity of any loan which may be granted shall not be longer than 30 days after the termination date of the charter.

#### § 251.13 Security.

The loans shall be approved only upon the furnishing of evidence that the past earnings record of the applicant provides reasonable assurance of repayment and the furnishing of any other security required by the Secretary.

#### § 251.14 Books, records and reports.

The right of the Secretary to inspect books, records and reports shall be the same as is set forth in § 250.12 of this subchapter.

#### § 251.15 Insurance required.

The owner will carry such insurance as may reasonably be necessary to protect the owner and charterer. Premium charges will be included in the charter hire.

#### § 251.16 Disclaimer.

No acts performed by the Secretary in the investigation of the loan application or otherwise shall constitute the Secretary as an agent for an owner or charterer and the Secretary does not warrant the performance or observance of any obligations of a charterer or owner under any charter or otherwise.

#### § 251.17 Penalties on default.

The penalties on default shall be as set forth in § 250.14 of this subchapter.

STEWART L. UDALL,  
Secretary of the Interior.

May 21, 1964.

## Department of Labor

### NEW REGULATIONS PROHIBIT WAGE DISCRIMINATION ON ACCOUNT OF SEX:

Regulations contained in Part 800--Equal Pay for Equal Work Under the Fair Standards Act, Title 29--Labor, Code of Federal Regulations were published in the Federal Register, April 25, 1964. The purpose of the new regulations is to make available official interpretations of the Department of Labor with respect to the meaning and application of the equal pay provisions added to the Fair Labor Standards Act by the Equal Pay Act of 1963 (Public Law 88-38). The Equal Pay Act was enacted on June 10, 1963, for the purpose of correcting "the existence in industries engaged in commerce or in the production of goods for commerce of wage differentials based on sex." The law amends the Fair Labor Standards Act by adding a new section 6 (d) to its minimum wage provisions.

The new regulations published in the Federal Register as 29 CFR Part 800 include Subpart A--General, and Subpart B--Requirements of the Equal Pay Act of 1963. Subpart B outlines scope and application in general, the equal pay for equal work standard, exceptions to equal pay standard, enforcement, and effective date.

The effective date of the new provisions is described in the regulations as follows:

"Sec. 800.123 General effective data. The equal pay provisions are effective on June 11, 1964. Full compliance is required on that date except in the case of certain employees covered by collective bargaining agreements for whom the statute further defers the time of its application.

"Sec. 800.124 Effective date for employees covered by collective bargaining agreements. The application of the equal pay provisions is deferred as to employees covered by bona fide collective bargaining agreements, which were in effect on May 11, 1963, and which do not terminate until some date after June 11, 1964. As to employees covered by such agreements the provisions will become effective on the termination date of the agreement or on June 11, 1965, whichever occurs first. . . ."

## Small Business Administration

### ALASKA FIRMS IN EARTHQUAKE DISASTER AREA RECEIVE SBA LOANS:

In late May 1964, the U. S. Small Business Administration (SBA) approved loans to help two firms which suffered damage during the earthquake in central Alaska, March 27, 1964. A loan of \$150,000 to the Berman Packing Company was approved which will enable the firm to operate its salmon cannery this year at Ninilchik in the Cook Inlet area. The Small Business Administration also approved a participation loan in which that Agency will join with an Alaskan bank to lend the Valdez Cold Storage Company \$250,000 to finish equipping a king crab processing vessel. That firm lost its plant at Valdez, Alaska, during the Good Friday earthquake.

Before the earthquake, the Valdez Cold Storage Company had received an industrial loan of \$184,100 from the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The ARA loan approved March 18, 1964, was made to help expand dock facilities at Valdez and outfit the king crab processing vessel.

Note: See Commercial Fisheries Review, May 1964 p. 78.



## Department of the Treasury

### INTERNAL REVENUE SERVICE

### ALASKANS RECEIVE TIME EXTENSION FOR INCOME TAX REDUCTION CLAIMS:

A decision by the U. S. Internal Revenue Service to grant persons suffering property losses from natural disasters an extension of time in which to apply for Federal income tax rebates was published in the Federal Register, May 19, 1964. The decision was called a "boon to Alaskans" by the Federal Reconstruction and Development Planning Commission for Alaska.

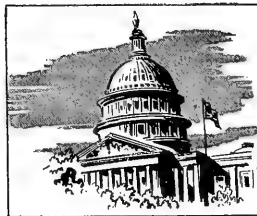
Senator Clinton P. Anderson, Chairman of the Alaska Reconstruction Commission, said that the amendment to Title 26 of the Internal Revenue Code will permit Alaska property owners and businessmen who suffered earthquake damage to amend their 1963 Federal income tax returns in order to seek immediate tax rebates or reductions in their estimated 1964 tax.

Senator Anderson urged all Alaskans owning quake-damaged property to consult the field office of the Internal Revenue Service in Anchorage, Alaska, in order to obtain maximum relief under the law. He pointed out that "all business loss, and all personal property loss over \$100 could be credited against tax payments over the past 3 years. . . thereby producing a considerable cash rebate from the Treasury Department." It was noted that "where the business loss exceeds the income over the past 3 years, tax credits may be projected as far as 5 years into the future."



## Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**INTERIM ADJOURNMENT:** By a voice vote the House on July 2, 1964, adopted H. Con. Res. 321, to provide that when the House adjourns on July 2 it stands adjourned until July 20. On the same date, the Senate also adopted H. Con. Res. 321, with an amendment to provide that when the Senate adjourns July 10, it be until July 20. Both the House and Senate reconvened on July 20.

**ALASKA DISASTER:** Alaska Earthquake Insurance (Hearings before the Committee on Interior and Insular Affairs, United States Senate, 88th Congress, 2nd Session), 163 pp., printed. Contains hearings held on April 14, 15, and May 5, 1964, on S. 2719, to amend the Alaska Statehood Act, to provide Federally-sponsored insurance protection against losses from earthquake and earthquake-related damage to real and personal property in the State of Alaska; contents of the bill; reports from various organizations, individuals, Senators, Congressmen, and Federal, State, and industry officials. Also contains a summary of major assistance measures adopted and proposed to assist Alaska.

On June 9, 1964, Senator Gruening in the Senate was granted permission to insert in that day's Congressional Record (pages 12665-12667) an article titled "Alaska: A Thorough Postmortem on Earthquake Urged on behalf of Both Science, Reconstruction," which appeared in the May 1 issue of *Science*.

On June 12, 1964, Senator Gruening spoke in the Senate concerning interest rates for Alaska disaster loans. The Senator inserted in that day's Congressional Record (page 13114) a statement of policy adopted by the executive committee of the American Legion, Department of Alaska.

On July 6, 1964, Senator Gruening spoke to the Senate concerning the recent Alaska earthquake. At the request of the Senator a statement by M. L. Grange, President of the Greater Seldovia Chamber of Commerce, was printed in the Congressional Record (pp. 15478-15479). The statement discussed economic conditions on the Kenai Peninsula after the earthquake.

**ALASKA OMNIBUS ACT AMENDMENT:** Alaska Reconstruction (Hearing before the Committee on Interior and Insular Affairs, United States Senate, 88th Congress, 2nd Session), 66 pp., printed. Contains hearing held June 3, 1964, on S. 2881, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes; contents of the bill; reports on communications from various organizations, individuals, Senators, and Federal, state, and industry officials. Also contains cost summary of Alaska urban renewal disaster projects.

On June 11, 1964, the Subcommittee on Territorial and Insular Affairs of the House Committee on Interior and Insular Affairs ordered reportedly favorably to the full committee, H. R. 11438, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the March earthquake and subsequent seismic waves. The Subcommittee received testimony from Department of the Interior officials and public witnesses.

On June 16, 1964, the Senate Committee on Interior and Insular Affairs ordered reported favorably with amendments S. 2881, providing assistance to Alaska for reconstruction of damage from the recent earthquake.

The House Committee on Interior and Insular Affairs ordered reported favorably to the House on June 18, 1964, H. R. 11438. On June 30, 1964, the Senate passed with committee amendments, S. 2881. On June 29, the House Committee on Interior and Insular Affairs (H. Rept. 1521) favorably reported to the House with an amendment H. R. 11438, referred to the Committee of Whole House on the State of the Union.

H. Rept. 1521, Amending the Alaska Omnibus Act to Provide Assistance to the State of Alaska for the Reconstruction of Areas Damaged by the Earthquake of March 1964 and Subsequent Seismic Waves (June 29, 1964, report from the Committee on Interior and Insular Affairs, United States House of Representatives, 88th Congress, 2nd Session), 25 pp., printed. The Committee recommended passage (with amendments) of H. R. 11438. Contains the purpose, section-by-section analysis, and need of the bill; amendments, executive recommendations, and changes in existing law.

The Senate Committee on Interior and Insular Affairs on June 25, 1964, favorably reported to the Senate S. 2881 (S. Rept. 1117).

S. Rept. 1117, Alaska Earthquake Reconstruction (June 25, 1964, report from the Committee on Interior and Insular Affairs, United States Senate, 88th Congress 2nd Session), to accompany S. 2881, 34 pp., printed. The Committee recommended passage (with amendments) of

S. 2881, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes. Contains the purpose of the bill, explanation of provisions, background, section-by-section analysis, changes in existing law, and individual views of Senator Gruening.

On June 29, 1964, the Senate considered S. 2881; no action was taken on the bill.

**ANADRAMOUS FISH CONSERVATION:** On June 25, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries ordered reported favorably to the full Committee H. R. 2392, with amendments. The amendments would require 50-50 matching funds by the states concerned and recommendations by the Secretary of the Interior to the Secretary of Health, Education, and Welfare concerning the elimination or reduction of the detrimental effects of polluting substances on fish and wildlife when information concerning such pollution is developed in studies under this Act or the Fish and Wildlife Coordination Act.

**ANTIDUMPING ACT AMENDMENT:** H. R. 11617 (Keith) introduced in the House, June 16, 1964, to amend the Antidumping Act of 1921; also, on June 22, H. R. 11681 (Matthews) introduced in the House; on June 29, 1964, H. R. 11823 (Pepper) was introduced in the House; referred to the Committee on Ways and Means. The remarks of the Congressman (Keith) in introducing his bill appear in that day's Congressional Record (p. 13531).

**COMMERCIAL FISHERIES FUND:** On June 25, 1964, Senator Bartlett spoke in the Senate concerning the amendment to the Interior Department appropriations bill which would add \$400,000 to the appropriation, and would make that sum available for emergency allocations pursuant to section 4(b) of Public Law 88-309 (S. 627) for aiding the fisheries of the Great Lakes area.

**FISH AND CANNERY WORKERS' RESOLUTION ON FISHERIES:** On July 2, 1964, Congressman Wilson spoke from the floor of the House inserting a resolution (Congressional Record, p. 15408) adopted by the fish and cannery workers special legislative conference held by the Seafarers International Union of North America. The resolution asks that the well being of the American workers be considered when decisions are made, when treaties are talked, and when actions are taken that could affect American fisheries. The fishery workers want a voice in consideration of fishery agreements.

**FOOD MARKETING NATIONAL COMMISSION:** National Commission on Food Marketing (Hearings before the Committee on Agriculture, United States House of Representatives, 88th Congress, 2nd Session), Serial SS, 150 pp., printed. Contains hearings held May 5, 6, and 7, 1964, on H. J. Res. 977, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer; includes text of the resolution; statements and communications from Federal and industry officials, representatives of associations and unions; Congressmen; and list of cases on price rigging, price discrimination.

Senator Magnuson spoke in the Senate on June 12, 1964, concerning the amendment by the House to S. J. Res. 71, to establish a National Commission on Food Marketing to study the food industry

from the producer to the consumer (Congressional Record, pp. 13158-13160).

On June 15, 1964, the Senate requested the return of S. J. Res. 71. The House complied with the request from the Senate and returned the joint resolution.

On June 19, 1964, the Senate concurred in House amendments to S. J. Res. 71, thus clearing the bill for the President's signature. Prior to that action, Senate rescinded its action of June 5, 1964, in agreeing to hold a conference with House on the bill and appointing conferees.

On June 23, 1964, Senator McGovern spoke from the floor of the Senate concerning the passage by the Senate of S. J. Res. 71 (Congressional Record, p. 14236).

On July 1, 1964, the Senate announced the appointment as Senate members of the National Commission on Food Marketing (created by Senate Joint Resolution 71), Senators Magnuson (Washington), McGee (Wyoming), Hart (Michigan), Morton (Kentucky), and Hruska (Nebraska). House members appointed are: Mrs. Sullivan (Mo.), Purcell (Tex.), Rosenthal (N. Y.), Cunningham (Nebr.), and Mrs. May (Wash.).

On July 3, 1964, the President signed S. J. Res. 71, (P. L. 88-354). Authorizes a 15-member Commission on Food Marketing. Provides for five appointees by the President, five Senators, and five Congressmen. Study will encompass food-price fluctuations, marketing procedures, and business relationships among farmers, processors, and retail outlets. The duties of the Commission are described as follows: "The Commission shall study and appraise the marketing structure of the food industry including the following: (1) the actual changes in the various segments of the food industry; (2) the changes likely to materialize if present trends continue; (3) the kind of food industry that would assure efficiency of production, assembly, processing and distribution, provide appropriate services to consumer; (4) the changes in statutes or public policy, the organization of farming and food assembly, processing, and distribution, and inter-relationships between segments of the food industry which would be appropriate to achieve a desired distribution of power as well as desired levels of efficiency; and (5) the effectiveness of the services and regulatory activities of the Federal Government in terms of present and probable development in the industry." Commission's report must be submitted by July 1, 1965. A budget of \$1.5 million is authorized.

The President picked Judge Marvin Jones to serve as Chairman; also appointed to the Commission: Fred Marshall of Grove City, Minn.; Albert Mitchell, New Mexico cattleman; William M. Batten, J. C. Penny Co. President; and Elmer R. Kiehl, an educator from Missouri Senate.

**INTERIOR DEPARTMENT APPROPRIATIONS, FY 1965:** H. Rept. 1519, Department of the Interior and Related Agencies Appropriation Bill, 1965 (June 26, 1964, report from the Committee of Conference, 88th Congress, 2nd Session), 11 pp., printed. The Committee reported agreement on amendments to H. R. 10433, making appropriations for the fiscal year ending June 30, 1965 and for other purposes. Contains amendments to the bill and general statements.

On June 22, 1964, the Senate considered H. R. 10433, fiscal year 1965 appropriations for the Department of the Interior, and related agencies, and adopted all committee amendments en bloc, which were then considered

as original text for the purpose of further amendment. No final action was taken on the bill. This bill includes funds for the U. S. Fish and Wildlife Service and its two bureaus--Commercial Fisheries, and Sport Fisheries and Wildlife.

The Senate on June 23 passed with amendments H. R. 10433, after adopting Hart amendment to provide \$400,000 for rehabilitation of the Great Lakes fisheries; asked for a conference with the House and appointed conferees.

On June 24, 1964, a message was received from the Senate announcing that the Senate had passed, with amendments in which the concurrence of the House was requested, H. R. 10433. The message also announced that the Senate insisted upon its amendments and appointed conferees.

The House on June 25, 1964, disagreed to the Senate amendments to H. R. 10433; agreed to a conference requested by the Senate; and appointed conferees. The conferees were scheduled to meet in executive session on June 26.

Pursuant to an order of the House on June 25, the conference report (H. Rept. 1519) on H. R. 10433, was printed in the Congressional Record of June 26. Included in the report for the Bureau of Commercial Fisheries are: Amendments Nos. 20 and 21, appropriating \$18,819,900 for management and investigations of resources instead of \$17,832,000 as proposed by the House and \$19,069,900 as proposed by the Senate. The increase over the House bill includes: \$87,000 for a vessel and additional reservoir research in South Da-

kota; \$50,000 for more adequate management and enforcement of fishing regulations in international waters; \$50,000 for initiation of a research program on shellfish processing and utilization at Ketchikan, Alaska; \$200,000 for initiation of a research program on North Atlantic lobsters; \$200,000 for initiation of a program to survey and research the sea clam; and \$400,000 to provide financial assistance, under section 4(b) of Public Law 88-309, to the Great Lakes commercial fishing industry included in the report for the Bureau of Sport Fisheries and Wildlife are: Amendment No. 22, appropriating \$33,810,000 for management and investigation of resources instead of \$33,550,000 as proposed by the House and \$34,330,000 as proposed by the Senate. The net increase over the House bill includes, among others, establishment of a cooperative fishery unit at the University of Arizona, \$30,000; expansion of North Central Reservoir Research, \$45,000; and a vessel and experimental facilities at the Sandy Hook Marine Laboratory, N. J., \$175,000. Also Amendment No. 23, appropriating \$7,016,200 for construction instead of \$6,074,700 as proposed by the House and \$7,275,300 as proposed by the Senate.

On June 29, 1964, the House, by a voice vote, adopted the conference report on H. R. 10433 and sent the legislation to the Senate. The Senate on the same date also adopted the conference report on H. R. 10433. This action cleared bill for the President. As provided by the conference report and passed by the Senate and House, the bill provides funds for the Fish and Wildlife Service as shown in the table.

On July 7, 1964, the President signed H. R. 10433 (Public Law 88-356).

Fish and Wildlife Service Appropriations for Fiscal Year 1964, and for Fiscal Year 1965: Budget Estimate, the House Allowance, the Senate Allowance, and the Conference Allowance

Item	Approp. FY 1964	Budget est. 1965 & 1964 Supplementals	House Allow.	Senate Allow.	Conf. Allow.
<b>Fish and Wildlife Service:</b>					
Office of the Commissioner of Fish and Wildlife:					
Salaries and expenses. . . . .	386,000	393,000	425,000	425,000	425,000
<b>Bureau of Commercial Fisheries:</b>					
Mgt. & inv. of res. . . . .	17,832,900	20,631,000	17,832,900	19,069,900	18,819,900
Mgt. & inv. of res. (appropriation of receipts). . . . .	-	-	(2,125,000)	(2,125,000)	(2,125,000)
Mgt. & inv. of res. (1964 supplement- al estimate). . . . .	-	100,000	-	-	-
Mgt. & inv. of res. (special foreign currency program). . . . .	300,000	300,000	300,000	300,000	300,000
Construction. . . . .	5,100,000	4,788,000	4,788,000	4,788,000	4,788,000
Construction of fishing vessels. . . .	750,000	-	-	-	-
General administrative expenses. . . .	653,000	676,000	667,000	667,000	667,000
Administration of Pribilof Islands (appropriation of receipts). . . . .	(2,468,000)	(2,442,000)	(2,442,000)	(2,442,000)	(2,442,000)
Limitation of administrative expenses, fisheries loan fund. . . . .	(270,000)	(277,000)	(277,000)	(277,000)	(277,000)
<b>Total, Bureau of Commercial Fisheries. . . . .</b>	<b>24,635,900</b>	<b>26,495,000</b>	<b>23,587,900</b>	<b>24,824,900</b>	<b>24,574,900</b>
<b>Bureau of Sport Fisheries &amp; Wildlife:</b>					
Mgt. & inv. of res. . . . .	30,529,900	34,359,000	33,550,000	34,330,000	33,810,000
Mgt. & inv. of res. (1964 supplement- al estimate). . . . .	-	300,000	-	-	-
Construction. . . . .	5,293,500	3,593,000	6,074,700	7,275,300	7,016,200
Migratory bird conservation account. .	10,000,000	8,000,000	8,000,000	8,000,000	8,000,000
General administrative expenses. . . .	1,359,000	1,384,000	1,384,000	1,384,000	1,384,000
<b>Total, Bureau of Sport Fisheries &amp; Wildlife. . . . .</b>	<b>47,182,400</b>	<b>47,636,000</b>	<b>49,008,700</b>	<b>50,989,300</b>	<b>50,210,200</b>
<b>Total, Fish and Wildlife Service. . .</b>	<b>72,204,300</b>	<b>74,524,000</b>	<b>73,021,600</b>	<b>76,239,200</b>	<b>75,210,100</b>

Note: Figures in parentheses are not included in totals since they are not one-year funds.



**INTERNATIONAL CONVENTION FOR THE NORTH-WEST ATLANTIC FISHERIES:** By unanimous consent on June 22, 1964, it was agreed that a ye-a-and-nay vote would be taken on June 23, on the question of adoption of the resolution of ratification concerning Protocol relating to harp and hood seals, proposed to the International Convention for the Northwest Atlantic Fisheries, signed at Washington, D. C., on February 8, 1949 (Ex. B, 88th Cong., 2nd sess.).

By unanimous vote of 83 yeas the Senate on June 23 adopted the resolution of ratification.

**MEDICAL CARE FOR VESSEL OWNERS:** On July 2, 1964, the House Committee on Rules reported (Rept. 1540) H. Res. 799, providing for the consideration of and 1 hour of debate on H. R. 3873, to permit certain owners of fishing boats to receive medical care and hospitalization without charge at Public Health Service hospitals.

**OCEANOGRAPHY:** Extension of remarks of Senator Magnuson inserting an address by Dr. Athelstan Spilhaus at a banquet held in Washington, D. C., on June 17, highlighting the first Navy symposium on military oceanography. The address was titled "Man in the Sea." (Congressional Record, pp. A3374-75.)

The Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries met June 23, 24, and 25 on proposed suggestions on the fiscal year 1965 report on oceanographic program. On June 24, 1964, the Subcommittee continued a discussion of oceanography with testimony given by James H. Wakelin, Assistant Secretary of the Navy, and Chairman of the Interagency Committee on Oceanography. Wakelin was also accompanied by D. L. McKernan and Dr. A. E. Maxwell, members of the Interagency Committee on Oceanography. They reported on the progress and accomplishments of the ICO since the previous hearings in 1962. Bureau Director McKernan testified as Chairman of the Instrumentation, Equipment, and Facilities Panel of the ICO.

On June 30, 1964, the Subcommittee continued hearings on oceanography, and received testimony from other Government witnesses.

**PESTICIDES COORDINATION: Administration of Pesticide Laws and Regulations** (Hearing before the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), Serial RR, 42 pp., printed. Contains hearing held on May 26, 1964, on the operation of the pesticide and insecticide laws and regulations; statements made by various Federal Officials; and information on interdepartmental coordination of activities relating to pesticides.

On June 12, 1964, Senator Dirksen spoke in the Senate concerning the U. S. Public Health Service conference in New Orleans regarding fish losses in the Mississippi River. The Senator inserted in that day's Congressional Record (pp. 13186-13187) a trade publication editorial discussing the conference.

Speaking in the Senate on June 18, 1964, Senator Ribicoff announced that the Subcommittee on Reorganization and International Organizations of the Senate Committee on Government Operations would resume its hearings on the role of Government in pesticide use, regulation, and research. The purpose of the hearings would be to consider the U. S. Public Health Service in-

vestigation of the recent Mississippi River fish kill. Senator Ribicoff summarized previous investigative actions concerning the Mississippi River fish kill and outlined conflicting opinions regarding the incident. (Congressional Record, p. 13754, June 18, 1964.)

The subcommittee on Reorganization and International Organization of the Senate Committee on Government Operations resumed its hearings on June 29 on interagency coordination of environmental hazards, with special regard to the buildup of pesticides in water sources and the general environment. Testimony was received from officials of the Public Health Service, Department of Health, Education, and Welfare, and the Agricultural Research Service, Department of Agriculture. Testimony concerned the recent fish kill in the Mississippi River. The purpose was to determine the facts behind charges of the chemical industry that they were not allowed to present adequately their side of the case involving marine fish kills attributed to pesticides in the lower Mississippi River at the Public Health Service hearing in New Orleans on May 5 and 6, 1964. Hearings were adjourned until sometime after July 20, 1964, when representatives of the chemical industry were to present testimony.

Congressman Beermann on June 17, 1964, under an extension of remarks, commented on the conflicting opinions concerning pesticides and fish losses in the Mississippi River. Two newspaper articles discussing pesticides, fish, and wildlife were included in the Congressman's remarks. (Congressional Record, Appendix pp. A3305-3306, June 17, 1964.)

On June 22, 1964, the Senate passed S. 1251 with committee amendments. The title was amended to read: "To amend the act of August 1, 1958, as amended, to increase the authorization for pesticide research by the Secretary of the Interior." This bill is a companion to H. R. 4487 (Dingell) which is pending before the House.

Congressman Broyhill under extension of remarks inserted in the Congressional Record, of July 6, 1964 (p. A3650) a statement by Mrs. Ruth G. Desmond of the Federation of Homemakers (given at a public hearing on the Mississippi River fish kill conducted by the Department of Agriculture), regarding the hazards of pesticides generally and the fish kill incident in the Louisiana area.

H. R. 4487 and S. 1251 would increase authorized appropriations for research into the effects of pesticides on fish and wildlife. Both bills would raise authorized annual appropriations from the existing \$2,565,000 to \$3.2 million in fiscal year 1965 and to \$5 million thereafter.

H. R. 4487 would require that each package of pesticide carry instructions as to how injury to fish and wildlife could be prevented. The bill would authorize the Secretary of the Interior "to operate and maintain existing facilities for the purpose of determining whether chemicals proposed to be used are harmful to fish and wildlife and to distribute this information to interested persons or agencies, both private and public." The Senate Committee on Commerce struck this provision from S. 1251, because Federal agencies have agreed to cooperate in getting cautionary wording on pesticides labels under the framework of existing law.

**STATE REGULATION OF CONTINENTAL SHELF FISHERIES RESOURCES:** S. 2903 (Bartlett) introduced in the Senate June 11, 1964, to provide for the conserva-

tion of certain fishery resources on the seabed or in the subsoil of the Outer Continental Shelf; referred to the Committee on Commerce. Senator Bartlett remarked that this is a bill to clarify the States' regulatory jurisdiction over Continental Shelf fishery resources; and that the bill would assign responsibilities for the fishery resources of the Continental Shelf to the several States.

The Senator said, "States should be formally and effectively enabled to regulate their Continental Shelf fisheries just as they do their other fisheries. Federal legislation of this nature should be consistent with congressional policy, as expressed in the Submerged Lands Act and the Outer Continental Shelf Lands Act of 1954. These acts confirm State jurisdiction over fishery resources within territorial waters. My bill would simply extend this jurisdiction to cover fishery resources of the Continental Shelf outside territorial waters. . . . Jurisdiction over fishery resources, of course, implies only the responsibility for managing the resources so that they will be conserved and developed for the benefit of present and future generations. Since the States are currently responsible for the resources within territorial waters and on the seabed beneath these waters, it seems logical and practical to extend this responsibility to the Outer Continental Shelf. Otherwise, split jurisdictions would result from Federal management of resources adjacent to those under State control. . . ." (Congressional Record, pp. 12958-12959.)

**SUPPLEMENTAL APPROPRIATIONS FY 1964:** On June 9, H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, was signed by the President (Public Law 88-317). The bill appropriates an additional \$47,162,000 for the Department of the Interior, including \$650,000 for the repair and replacement of Bureau of Commercial Fisheries' facilities and equipment damaged in the Alaska earthquake.

**TERRITORIAL WATERS OF THE UNITED STATES:** Rep. Pelly spoke in the House concerning Soviet fishing vessels attempting to run American halibut fishermen off traditional American fishing grounds in the Gulf of Alaska. (Congressional Record, p. 14138.)

**TRADE EXPANSION ACT AMENDMENT:** H. R. 11744; H. R. 11761 through H. R. 11811, introduced on June 25 in the House, bills to amend the Trade Expansion Act of 1962; referred to Committee on Ways and Means. Congressman Pillion spoke in the House on June 25, inserting the text of H. R. 11797, an explanation of its provisions, and a summary explanation of the criteria contained in the bill. The Congressman pointed out that the bills are designed to minimize the number of import items that can be the subject of negotiated tariff cuts or concessions, and establishes specific statutory criteria and degrees of damage resulting from foreign imports. If a segment of industry or labor suffers the prescribed degree of damage, its product will become mandatorily reserved from further tariff reduction negotiations. Included in the partial list of products cited by Congressman Pillion as qualifying for protection are fishery products. Other Congressmen also spoke in the House concerning these bills. (Congressional Record, pp. 14508-14527.) On June 29, H. R. 11825 (Secret) and June 30, H. R. 11833 (Baring) and H. R. 11848 (Riehlman) were introduced in the House; similar to H. R. 11797; referred to the Committee on Ways and Means.

**VESSEL CONSTRUCTION SUBSIDY AMENDMENT:** Fishing Vessel Subsidies Part 2 (Hearing before the Subcommittee on Fisheries and Wildlife Conservation, Committee on Merchant Marine and Fisheries, United States House of Representatives, 88th Congress, 1st Session), 171 pp., printed. Contains hearings held November 13, 1963, on H. R. 2172, H. R. 2743, and S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of Fishing Vessels, and for other purposes; including text of S. 1006; reports from various Federal agencies; and statements and communications from Federal, industry, and association officials.

On June 10, 1964, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries ordered reported favorably to the full Committee S. 1006 (amended), to amend the U. S. Fishing Fleet Improvements Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. (This bill passed the Senate on October 2, 1963.)

On June 18, 1964, the House Committee on Merchant Marine and Fisheries ordered reported to the House S. 1006 (amended). The Committee retained the Subcommittee's amendments which would reduce the maximum commercial fishing vessel construction subsidy to be available from 55 to 50 percent, and that a subsidy be granted only "after notice and hearing." Also, the House Committee extended the period for the subsidy from June 30, 1968, to June 30, 1969; and added an amendment to Sec. 9 of the 1960 law which inserts language that would give the Secretary flexibility to allow the transfer of subsidized vessels under certain conditions to another fishery after notice and hearing.

On June 30, 1964, the House Committee on Merchant Marine and Fisheries reported to the House, S. 1006, with amendment (H. Rept. 1524); referred to the Committee of the Whole House on the State of the Union.

H. Rept. 1524, Fishing Vessel Construction (June 30, 1964, report from the Committee on Merchant Marine and Fisheries, United States House of Representatives, 88th Congress, 2nd Session, to accompany S. 1006), 25 pp., printed. The Committee recommended passage (with amendments) of S. 1006, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. Contains the purpose, need, section-by-section analysis of the bill, departmental reports, changes in existing law, and minority views.

**VESSEL ENGAGED IN FISHERIES:** The House Committee on Merchant Marine and Fisheries on June 23 favorably reported without amendment H. R. 6007, a bill to permit the vessel SC-1473 to engage in the fisheries.

On June 25, 1964, the House passed by a voice vote H. R. 6007, to document under the American flag, for fishing purposes, a vessel (SC-1473) that was built during World War II by the Navy through a subcontractor in Canada and which is a derelict in the Charleston Harbor.

**WATER POLLUTION:** On June 26, 1964, Senator Muskie spoke to the Senate about the prevention, control, and abatement of water pollution. He mentioned the massive fish kills which have taken place in the fall and winter months of every year since 1960, in the lower Mississippi and Atchafalaya Rivers and the Gulf of Mexico. The Senator discussed the technical report of the

U.S. Department of Health, Education, and Welfare on the fish kills in question, and the points at issue between the Government and industry (Congressional Record, June 26, pp. 14680-14682).

On July 2, 1964, Congressman Curtis spoke in the House concerning the problem of water pollution and the efforts of the American chemical industry on the preservation of water quality. He pointed out that the industry in June embarked upon an extensive research program to determine how organic chemicals act in streams, lakes, and rivers, and how treatment processes for sanitary sewage react upon those chemicals (Congressional Record, July 2, 1964, pp. 15385-15386).

**WATER RESOURCES COUNCIL: Water Resources Planning Act** (Hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, House of Representatives, 88th Congress, 2nd Session), 241 pp., printed. Contains

hearings held March 23, 24, 26, and April 20, 1964, on S. 1111 and H. R. 3620, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a Water Resources Council and River Basin Commission, and by providing financial assistance to the States in order to increase state participation in such planning; contents of the bills; reports from various departments, individuals; Senators, Congressmen, and Federal and State officials.

On June 23, 1964, the Senate Committee on Interior and Insular Affairs' Subcommittee on Irrigation and Reclamation met in executive session on S. 1111, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission. No action was taken.



### JAPANESE RAFT CULTURE OF OYSTERS

Japan has made remarkable progress in raft oyster culture in recent years. The Japanese usually anchor their oyster rafts 25 or 30 miles from population centers.

Wires to which scallop shells have been affixed are suspended from the rafts and oysters attach themselves to the shells, providing a crop which is easy to inventory and readily harvested.

The rafts with their burdens of oysters may be moved from one area to another in case of pollution.

This method now accounts for more than 85 percent of Japan's oyster culture, a 70-percent increase within the past 10 years. And overall production through culture has more than doubled.

Total production of one raft over a period of approximately nine months may be as much as 200 bushels, or about one-half bushel per wire. (Australian Fisheries Newsletter, June 1964.)



Oyster-culture rafts anchored in a deep protected bay.



# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title   |
|----------|---|
| CFS-3438 | - Fish Meal and Oil, January 1964, 2 pp.                        |
| CFS-3440 | - Frozen Fishery Products, February 1964, 8 pp.                 |
| CFS-3451 | - Frozen Fishery Products, 1963 Annual Summary, 14 pp.          |
| CFS-3470 | - Frozen Fishery Products, March 1964, 8 pp.                    |
| CFS-3475 | - Maine Landings, 1963 Annual Summary, 15 pp.                   |
| CFS-3476 | - Rhode Island Landings, 1963 Annual Summary, 8 pp.             |
| CFS-3477 | - South Carolina Landings, 1963 Annual Summary, 6 pp.           |
| CFS-3481 | - North Carolina Landings, 1963 Annual Summary, 9 pp.           |
| CFS-3483 | - New Jersey Landings, February 1964, 3 pp.                     |
| CFS-3487 | - Massachusetts Landings, December 1963, 8 pp.                  |
| CFS-3489 | - Virginia Landings, February 1964, 3 pp.                       |
| CFS-3491 | - New York Landings, February 1964, 4 pp.                       |
| CFS-3492 | - Wisconsin Landings, February 1964, 2 pp.                      |
| CFS-3493 | - Louisiana Landings, February 1964, 3 pp.                      |
| CFS-3494 | - Shrimp Landings, December 1963, 8 pp.                         |
| CFS-3495 | - Wisconsin Landings, 1963 Annual Summary, 3 pp.                |
| CFS-3496 | - Gulf Coast Shrimp Data, December 1963, 20 pp.                 |
| CFS-3498 | - Rhode Island Landings, January 1964, 3 pp.                    |
| CFS-3499 | - Alabama Landings, 1963 Annual Summary, 7 pp.                  |
| CFS-3502 | - Georgia Landings, 1963 Annual Summary, 9 pp.                  |
| CFS-3503 | - California Landings, February 1964, 4 pp.                     |
| CFS-3504 | - North Carolina Landings, March 1964, 4 pp.                    |
| CFS-3506 | - Florida Landings, March 1964, 8 pp.                           |
| CFS-3508 | - Massachusetts Landings, by Ports, 1963 Annual Summary, 14 pp. |
| CFS-3510 | - Michigan Landings, February 1964, 3 pp.                       |
| CFS-3511 | - Mississippi Landings, 1963 Annual Summary, 6 pp.              |

- | Number            | Title   |
|-------------------|---|
| CFS-3512          | - Fish Meal and Oil, February 1964, 2 pp.   |
| CFS-3513          | - Louisiana Landings, March 1964, 3 pp.   |
| CFS-3514          | - New York Landings, March 1964, 4 pp.  |
| CFS-3516          | - Maryland Landings, March 1964, 3 pp.  |
| CFS-3518          | - Fish Meal and Oil, March 1964, 2 pp.  |
| CFS-3519          | - North Carolina Landings, April 1964, 4 pp.  |
| CFS-3520          | - Shrimp Landings, 1963 Annual Summary, 16 pp.  |
| CFS-3522          | - Maine Landings, March 1964, 4 pp.   |
| CFS-3524          | - Florida Landings, April 1964, 8 pp.   |
| Sep. No. 705      | - Improved Rapid Method for Determining Total Lipids in Fish Meal   |
| Sep. No. 706      | - Soviet Fishing Industry   |
| SSR-Fish. No. 480 | - Further Studies of Protein and Calorie Levels of Meat-Meal, Vitamin-Supplemented Salmon Diets, by Laurie G. Fowler, J. Howard McCormick, Jr., and Allan E. Thomas, 15 pp., February 1964. |

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

- | Number   | Title   |
|----------|---|
| MNL - 87 | - Survey of the Dominant Conditions Affecting the Development of the Cartagena (Colombia) Fishery, 58 pp. |

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, April and May 1964, 14 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, February, March, and April 1964, 13, 14, and 14 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014,

Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf Fisheries (Selected Areas) - 1963, by E. J. Barry, 42 pp., illus., June 1964. (Market News Service, U. S. Fish and Wildlife Service, 600 South St., New Orleans, La. 70130.) Summarizes the commercial landings of fish and shellfish for selected areas of the Gulf States of Florida (West Coast), Alabama, Mississippi, Louisiana, and Texas. The tables show landings for only the specific areas designated and cannot be interpreted as representing the total landings for a given State. However, the data do give an indication of general trends. Part I reports on developments and conditions in Gulf Coast fisheries during 1963 and gives a resume of the individual fisheries. Discusses the shrimp fishery in detail; production and market conditions for the oyster, blue crab, and finfish fisheries; as well as imports of fresh and frozen fish and shellfish. Part II includes statistical tables showing total fishery products landings; crab meat production by areas and months; and menhaden landings and production of fish meal, oil, and solubles. It also gives data on fishery imports through the New Orleans and Morgan City, La., Customs Districts, Port Isabel-Brownsville and Houston, Tex., and Mobile, Ala.; and LCL express shipments from New Orleans for 1963 by months and destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States oyster and shrimp packs, 1962/63 season and packs by seasons 1958-63; and fishery products market classifications in the Gulf Area.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, April 1964, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23669.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Annual Summary, 1963, by Robert A. Hall and Henry R. McAvoy, 52 pp., illus., May 1964. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Reviews the fishery marketing trends and conditions at the principal New England ports,

and highlights of the fisheries in other areas and competitive foreign countries. The latest developments in the purse-seine tuna, swordfish long-line, and offshore lobster fisheries are also reviewed. The fishery industries at the principal ports produced less food and industrial fish in 1963, but an exceptionally lucrative catch at New Bedford caused a higher total ex-vessel value than in 1962. The summary covers food-fish landings by ports and species; industrial fish landings and ex-vessel prices; fishing vessel news; imports; frozen fishery products; the fish-meal market; Canadian plans to extend Fishing Limits to 12 miles, and other information. Also includes fishery landings and ex-vessel prices for ports of Boston, Gloucester, New Bedford, Provincetown, Portland, Rockland, Point Judith, and Stonington; highlights of the Maine sardine fishery; events in the fisheries of Canada, Denmark, Iceland, Japan, and Peru; and historical data of fisheries at principal New England ports. In addition, contains data on monthly landings and ex-vessel prices, by species at Boston and Atlantic Ave. fish piers.

New England Fisheries--Monthly Summary, April 1964, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1964, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### AMINO ACIDS:

"Chromatographic determination of amino acids in fish stickwater," by Yu. A. Vorotnikov, article, Chem-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ical Abstracts, vol. 57, July 23, 1962, 2636f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"2-Aminoethylphosphonic acid in insoluble protein of the sea anemone *Metridium dianthus*," by Louis D. Quin, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1133-1134, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### ANCHOVY:

"The ripening process of anchovy," by F. Alm, article SIK-Rapport, no. 123, 1962, p. 41, printed in Swedish. Svenska Institutet for Konserverings-Forskning, Kalleback 1, Goteborg, Sweden.

#### AQUATIC PLANTS:

"Control of aquatic plants big problem," by Joe Logan, article, *South Carolina Wildlife*, vol. 11, no. 2, Spring 1964, pp. 6-9, illus., printed. South Carolina Wildlife Resources Department, Box 360, Columbia, S. C.

#### ARGENTINA:

Establishing a Business in Argentina, by James M. von Stroebel, OBR 64-33, 20 pp., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) During the period 1960-62 the Argentine Government's economic policy was oriented toward the stimulation of private participation in industry and commerce, and of private foreign investment. This report discusses that country's investment climate, legislation governing investment, and business organization. Also covers patents, trademarks, and copyright; employment conditions; and the taxation picture.

#### BIOCHEMISTRY:

"Correlations between the mineral elements and protein level in fish," by E. N. Vasil'eva, N. E. Dyubyuk, and T. D. Lychnikova, article, *Chemical Abstracts*, vol. 57, November 26, 1962, p. 14302b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Isolation of a substance with antithiamine activity from carp intestines," by J. C. Somogyi and H. Kuendig-Hegedus, article, *Chemical Abstracts*, vol. 59, November 11, 1963, 11938h, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

#### BRINE COOLING:

"Cooling sprats in saline solutions," by L. G. Mikhailova, article, *Kholodil'naia Tekhnika*, no. 2, 1964, pp. 41-43, illus., printed in Russian, single copy 60 Kopecks (about 67 U. S. cents). Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003.

#### CALIFORNIA:

Inshore Fishes of California, by John L. Baxter, 80 pp., illus., printed, 35 cents, revised 1963. Printing Division, Documents Section, N. Seventh St. at Richards Blvd., Sacramento, Calif. 95814.

#### CANADA:

"Canada's fisheries markets in 1963," by T. R. Kinsella, article, *Foreign Trade*, vol. 121, no. 10, May 16, 1964, pp. 2-8, illus., printed. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Covers briefly Canadian production, imports, and exports of fishery products during 1963. Total exports reached an all-time high of over C\$172 million. This article discusses exports and production of fresh and frozen fish, salted and canned fish, molluscs and crustaceans, and fish meal and oil. Mentions research conducted by the Fisheries Research Board of Canada in perfecting a fish flour for human consumption.

#### Fisheries Statistics, Manitoba, 1962, Catalogue No.

24-210, 10 pp., processed in French and English, March 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish landed in Manitoba, 1955-1962; quantity and value of landings by species and fisheries districts, 1961-1962; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

#### Fisheries Statistics, Ontario, 1962, Catalogue No. 24-

209, 11 pp., illus., processed in French and English, April 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish landed in Ontario, 1955-1962; quantity and value of landings by species and fisheries districts, 1961-1962; capital equipment used in the primary fisheries operations; number of persons engaged in the fisheries; and new capital investment in the commercial fishery.

#### Fisheries Statistics, Saskatchewan, 1962, Catalogue

No. 24-211, 8 pp., processed in French and English, April 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains data on the value of fish landed in Saskatchewan, 1955-1962; quantity and value of landings by species, 1961-1962; quantity and value of landings by major species and by lakes; capital equipment in primary fisheries operations; and the number of persons engaged in the primary fisheries.

#### CHEMICAL COMPOSITION:

"The environment for chemical change in dried and frozen foods," by R. B. Duckworth and G. M. Smith, article, *Proceedings of the Nutrition Society*, vol. 22, no. 2, 1963, pp. 182-189, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

#### COLD STORAGE:

"Cold storage of cod fillets treated with polyphosphates," by Eiichi Tanikawa, Minoru Akiba, and Akira Shitamori, article, *Food Technology*, vol. 17, November 1963, pp. 87-92, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

#### COLOMBIA:

Basic Data on the Economy of Colombia, by Herbert A. Lindow, OBR 64-35, 24 pp., illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Although some declines in agricultural production and high food prices may have a retarding effect, there

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are good possibilities that Colombian economic growth in 1964 will exceed the 5 percent rate registered in 1963. The report discusses general features of the country--geography, population, and government; government representation between Colombia and the United States; structure of the economy; agriculture; mineral resources; and manufacturing. Also covers power, transportation and communications, labor force, finance, foreign trade, the government's role in the economy, and the Alliance for Progress. A short section discusses the Pacific Coast and Magdalena River fishery resources, and exports of Colombian shrimp to the United States.

#### COMMUNIST CHINA:

Sea Fisheries in Communist China, by Shigeaki Shindo, Overseas Fisheries Series No. 2, 38 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

#### CONSERVATION:

Conserving American Resources (Second Edition), by Ruben L. Parson, 533 pp., illus., printed, 1964, \$8.95. Prentice-Hall, Inc., Englewood Cliffs, N. J. 07632. The population explosion is something that we are continually reading about, and one of the resulting problems is conservation of our natural resources. Our major natural resources and the interrelationship among all resources are discussed very adequately in this book. In the preface the author emphasizes that more busy Americans can and should become interested in the story of our national resources and the ways they can be conserved. How resource conservation is the real connecting link between natural and social sciences is explained by the author. Not only facts and figures are to be found in the book, but also concepts. Presented is the latest thinking on such topics as Federal aid in fish and wildlife rehabilitation, multiple use of forest land, the economic plight of the commercial fisheries, land reserves, wetlands for ducks, and management of public lands. The author very ably points out: "What follows is largely an attempt to acquaint thinking Americans with the broad categories of natural wealth upon which their well-being depends. The treatment of each category includes a brief statement of its usefulness, a quick glance at its past history, and several suggestions for getting greater benefit from it in the future. The entire discussion is a development of concepts rather than a recitation of facts; an exhortation to think and participate rather than an exposition on statistics and techniques." In commenting on the importance of conservation to Americans, the author states that each of us should have a "whistling knowledge" of it. In discussing "The Conservation Idea," the subject of the first chapter, the author says that conservation of natural resources means the fullest possible use of them without abusing the ones exploited, without destroying any needlessly, and without neglecting any that can be used. Also, natural resources serve us every day of our lives in almost everything we do, and they are essential to our existence. But more important, our continued prosperity depends upon the wisdom with which we use them. The author takes the positive approach. Discussed in the book are the natural environment and resources; water on the land, and its conservation;

our soils and their depreciation, and their conservation; spoilation and restoration of our dry grasslands; our forests and their exploitation and conservation; conservation patterns on the land; functions and abuses of wildlife, and its conservation; resources for recreation, inspiration, and instruction; resources of our bordering seas; mineral fuels and major metals, and their conservation. The last chapter deals with prospect and responsibility and points out that conservation is the key to future prosperity. Fish and fishing, both sport and commercial, are adequately covered in view of the wide scope of the book. For example, with reference to fishery resources, the book covers propagation, control of numbers, gear and techniques, habitats, imports and exports, overfishing, restoration projects, international fisheries agreements, fisheries regulation and standardization, fish flour or fish protein concentrate, fish oil and meal, packaging and transportation, species variety, underutilization, agar, algin, fur seals, interstate fishery commissions, and much more. This partial listing shows that the author has really delved into the subject of fisheries. He has done the same with the other resources. Although an excellent book for professionals, it is not too technical for any reader interested in our Nation's resources, and who wants to learn how he may help conserve them. This is a serious subject, but the author has treated it in a lively and readable manner. Those interested in commercial fisheries will find many interesting ideas and concepts regarding our fishery resources. The appendix contains teaching aids and a good listing of current literature. Because of its excellent index and marginal notes, it is a good book to have on hand for quick reference.

--Joseph Pileggi

#### CRABS:

"How crabs adjust themselves to changing salinity," article, *New Scientist*, vol. 16, October 11, 1962, p. 105, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"N-ethylmaleimide inhibition of horseshoe crab hemocyte agglutination," by F. T. Bryan and others, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1147-1148, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### CRAWFISH:

"Rice farmers raise crawfish in Louisiana paddies to lift income," by Fred Zimmerman, article, *Wall Street Journal*, vol. 69, December 10, 1963, p. 1, printed. Dow, Jones & Co., Inc., 1540 Market St., San Francisco 19, Calif.

#### CRUSTACEANS:

Nombres vulgares y científicos de las principales especies comerciales de crustáceos de Cádiz (Common and scientific names of the principal commercial species of crustaceans at Cádiz), by Julio Rodríguez-Roda, 2 pp., printed in Spanish, 1964. (Reprinted from *Investigación Pesquera*, vol. 25, January 1964, pp. 3-4.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### DAHOMÉY:

Basic Data on the Economy of Dahomey, by Donald M. MacLay, OBR 64-36, 12 pp., illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents information on Dahomey's geography and climate, form of government, and population; economic structure; agriculture and forestry; mining; industry, and power supplies. Also covers transportation, communications, finance, foreign trade; a program for economic development, marketing, and government representation between Dahomey and the United States. A short section discusses the importance of the fishing industry and potential for future development.

#### DOLPHIN:

"Visual problem-solving in a bottlenose dolphin," by Winthrop N. Kellogg and Charles E. Rice, article, Science, vol. 143, no. 3610, March 6, 1964, pp. 1052-1055, illus., printed, single copy 35 cents. American Association of the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. In the study here reported, a captive 8-year-old dolphin, well adapted to contact with human beings, was tested by the discrimination method for underwater perception of visual forms or patterns. The animal successfully discriminated 21 of the 25 pairs of stimuli presented.

#### DRYING:

"New accelerated fish drying method," article, Food Manufacture, vol. 38, December 1963, pp. 669-670, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

#### ENZYMES:

"Zone electrophoretic separation of five phosphoglucose activities from fish muscle," by E. Roberts and H. Tsuyuki, article, Chemical Abstracts, vol. 59, October 28, 1963, 10389g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

#### FARM PONDS:

Construction and Management of Farm Ponds in Ontario, by H. D. Ayers, H. R. McCrimmon, and A. H. Berst, Publication 515, 39 pp., printed. Ontario Department of Agriculture, Parliament Bldgs., Toronto, Canada.

#### FATTY ACIDS:

"Component fatty acids of the blubber fat from the common or harbor seal *Phoca vitulina concolor* de Kay," by P. M. Jangaard, R. G. Ackman, and R. D. Burgher, article, Canadian Journal of Biochemistry and Physiology, vol. 41, December 1963, pp. 2543-2546, printed. National Research Council, Ottawa, Canada.

"Effect of linolenic, linoleic, and oleic acids on measuring protein extractability from cod skeletal muscle with the solubility test," by Margaret L. Anderson, Frederick J. King, and Maynard A. Steinberg, article, Journal of Food Science, vol. 28, May-June 1963, pp. 286-288, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Gas-liquid chromatographic separation and determination of volatile fatty acids in fish meat during spoilage," by Shojiro Miyahara, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, January 1961, pp. 42-47, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

"The influence of dietary fatty acids and environmental temperature on the fatty acid composition of Telesost fish," by Raymond Reiser and others, article, Journal of the American Oil Chemists' Society, vol. 40, October 1963, pp. 507, 513, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

#### FISH BEHAVIOR:

Fish Migration, by David Gunston, Wildlife Bulletin No. 33, 3 pp., illus., printed, 1962. (Reprinted from Louisiana Conservationist, February 1959.) Louisiana Wildlife Life and Fisheries Commission, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

#### FISH COOKERY:

Louisiana Cook-Out, by Percy Viosca, Jr., Wildlife Education Bulletin No. 31, 15 pp., illus., printed, 1962. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. "Why go to Gloucester to enjoy a clambake at the beach? New England has no monopoly on that delightful form of recreation," states the author. This booklet describes the many types of shellfish and fish in Louisiana which are suitable for outdoor cooking. There are oysters, shrimp, river catfish, spoonbill sturgeon, carp, and crabs. Included are recipes for crab-meat stuffed peppers, smoked fish, and a spicy seafood sauce.

#### FISH CULTURE:

"Sea fish breeding," article, Current Affairs Bulletin of the Indo-Pacific Fisheries Council, no. 37, August 1963, pp. 25-26, printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office, Bangkok, Thailand.

#### FISHERY POLICIES:

Fishery Policies in the United Kingdom, The Federal Republic of Germany and Norway, by A. Arimatsu and B. Ikejiri, Overseas Fisheries Series No. 3, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

#### FISH MUSCLE:

"Chemical change in fish muscle during storage," by N. R. Jones, article, Proceedings of the Nutrition Society, vol. 22, no. 2, 1963, pp. 172-176, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

"Extractives of fish muscle. 3--Amounts, sectional distribution, and variations of fat, water-solubles, protein and moisture in cod (*Gadus morhua* L.) filets," by N. Damberg, article, Journal of the Fisheries Research Board of Canada, vol. 20, July 1963, pp. 909-918, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies on muscle of aquatic animals. XXXIII--Seasonal variation of nitrogenous extractives in squid muscle," by Kinji Endo and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

28, November 1962, pp. 1099-1103, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

#### FISH OILS:

"Autoxidation of fish oils. II--Changes in the carbonyl distribution of autoxidizing salmon oils," by C. Jane Wyatt and E. A. Day, article, *Journal of Food Science*, vol. 28, May-June 1963, pp. 305-312, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"The effect of some marine oils and squalene on the plasma cholesterol in chicks," by Olaf R. Braekkan, Leif Rein Njaa, and Finn Utne, article, *Fiskeridirektoratets Skrifter, Serie Teknologiske Undersøkelser*, vol. 4, no. 4, 1962, pp. 1-12, printed. Fiskeridirektoratet, Bergen, Norway.

"Identification of the major polyunsaturated C<sub>16</sub> acids of marine oils by GLC separation factors on normal and organosilicone polyesters," by R. G. Ackman and P. M. Jangaard, article, *Journal of the American Oil Chemists' Society*, vol. 40, December 1963, pp. 744-745, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

#### FISH SAUSAGE:

"Change of the vitamin A concentration in enriched fish sausage during storage in summer," by Akit-sugu Kenmoku and Hiroyuki Iwao, article, *Chemical Abstracts*, vol. 59, July 22, 1963, 2104d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Diffusion of oxygen in packed sausage," by Akira Kishimoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, August 1963, pp. 781-784, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

"Fish sausages," by Michael Lorant, article, *Food Manufacture*, vol. 38, August 1963, pp. 413-414, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

#### FISHWAYS:

"Evaluation of the Fish Passage Facilities at the Pelton Project on the Deschutes River in Oregon," by Robert T. Gunsolus and George J. Eicher, 133 pp., illus., printed, 1962. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Ore. 97201.

#### FREEDOM FROM HUNGER:

"Freedom from Hunger Campaign News, vol. 5, no. 31, May-June 1964, 33 pp., illus., printed. Co-Ordinator's Office, Freedom from Hunger Campaign, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This issue is dedicated to 'the men who harvest the sea.' Contains, among others, articles on: 'The warning of the blue whale,' by Donovan B. Finn; 'Detectives of the deep,' by Peyton Johnson; 'Have whalers become too efficient?' by Mack Laing; 'Outboard motors power a 'revolution' in fishing,' 'From dugout to factoryship,' 'Tuna--the question mark of the sea,' 'Inland fishing--new

frontier for food,' 'Solution for malnourished millions?,' and 'Thriving farms on the bottom of the sea.'

#### FREEZE-DRYING:

"Freeze-drying: with or without vacuum," by John P. O'Meara, article, *Food Engineering*, vol. 35, September 1963, pp. 55-56, printed. Chilton Co., Chestnut and 56th Sts., Philadelphia, Pa.

"The truth about freeze drying," by Sam Martin, article, *Quick Frozen Foods*, vol. 26, no. 10, May 1964, pp. 29-32, illustrated, printed. E. W. Williams Publications, Inc., 1776 Broadway, New York 19, N. Y. Discusses the practicality of freeze-dried foods. This process offers limited competition to conventional freezing processes. Its best uses will be for instant coffee, ingredients for some dry mixes, and military foods. The author believes it will supply frozen food packers with additional markets and broaden the use of freezing equipment.

#### FREEZING:

"Freezing of crabmeat," by S. V. Gangal and N. G. Magar, article, *Food Technology*, vol. 17, December 1963, pp. 101-106, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

#### FRESH FISH:

"Factors influencing the effectiveness of fresh fish washing operations," by W. A. MacCallum, M. W. Mullan, and Isabel N. Plaunt, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, September 1963, pp. 1231-1244, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### FROZEN FISH:

"Effect of processing on public health bacteria in frozen seafoods," by H. Raj and J. Liston, article, *Food Technology*, vol. 17, October 1963, pp. 83-89, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

"Electronic defrosting of meat and fish at 35 and 2,450 Mcs. A laboratory comparison," by N. Bengtsson, article, *Food Technology*, vol. 17, October 1963, pp. 97-100, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

#### HERRING:

"Volatile acids in fish as an index of suitability for consumption. I--Salted herrings," by Jozef Wierzechowski and Maria Severin, article, *Chemical Abstracts*, vol. 57, November 26, 1962, 14248f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

#### HORMONES:

"Isolation of hormone-containing particles from the neurohypophysis of the cod (*Gadus morhua*), by K. Lederis, article, *Biochemical Journal*, vol. 84, July 1962, pp. 27P-28P, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

#### INDIA:

"Fishing off the west coast of India," by Kare Larssen, article, *Fishing News International*, vol. 3, no. 2, April-June 1964, pp. 128, 130-131, illus., printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Highway Publications Ltd., Ludgate House, 110 Fleet

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

St., London EC4, England. Discusses trawling off the west coast of India, chiefly for shrimp, initiated in 1954 by the Indo-Norwegian Project. At times there is a great abundance of sardines, mackerel, tuna, pomfret, and other fish, but these species do not turn up regularly. This article covers weather conditions, fishing seasons, problems of fish location and landing, and charting of the fishing grounds by two research vessels.

#### INDONESIA:

Foreign Trade Regulations of Indonesia, by Virginia Webbert, OBR 64-39, illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Foreign trade controls operate mainly through a licensing system requiring the surrender of exchange from exports and the issuance of combined import-exchange licenses for imports which enable the Government to link imports closely to exchange availabilities. Discusses trade and foreign exchange policy; import tariff system; sales and other internal taxes; documentation and fees; and labeling, marking, and packing requirements. Also covers special customs provisions, nontariff import trade controls, Indonesia's export controls, United States controls, and government representation between the two countries.

#### JAPAN:

"Fisheries research in Japan," by C. R. S. Manders, article, *Nature*, vol. 202, no. 4934, May 23, 1964, pp. 755-757, printed, single copy 4s. (about 56 U.S. cents). St. Martin's Press, 175 Fifth Ave., New York, N. Y. 10010. Discusses the evolution of the Tokai Regional Fisheries Research Laboratory, its activities, and its scientific publications.

#### Present Status of the Fisheries Extension Service

(Technological), Fisheries Administration Series No. 2, 58 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

#### KOREA, REPUBLIC OF:

Foreign Trade Regulations of the Republic of Korea, by Lois J. DeNauw, OBR 64-24, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The government of the Republic of Korea maintains strict controls over foreign trade and exchange transactions in order to conserve its limited foreign exchange reserves and to provide protection and encouragement to its local developing industry. This report discusses Korea's import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also covers nontariff import trade controls, United States foreign trade controls, Korea's export controls, and diplomatic representation between the two countries.

#### LAVER:

On a Method of Making More Productive Fishery of the Lavers (PORPHYRA)--Engineering Ways of

Improvement and Construction, by Takeo Kurakake, Fisheries Agriculture Series No. 3, 54 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

#### MARINE MAMMALS:

"Observations of Odontocetes in central Californian waters," by Robert L. Brownell, Jr., article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 60-62, 64, 66, illus., printed. Hvalfangstforeningen, Sandefjord, Norway. Reports observations of 8 different species of odontocetes made during the summer of 1963.

#### MARINE OILS:

"The effects of marine animals oils and other marine products on cholesterol metabolism. A review," by Takashi Kaneda, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, April 1963, pp. 387-398, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

#### MOZAMBIQUE:

Basic Data on the Economy of Mozambique, by Ellen Gavrisheff, OBR 64-29, 8 pp., illus., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This Portuguese province has an extensive coastline and the territorial waters abound in a large variety of fish. A new large fishing company, formed in 1963 with a capital of \$2.8 million, expects annually to freeze some 30,000 tons of fish for export. This report discusses the form of government and population, structure of the economy, agriculture, livestock and forestry, and mining and industry. Also covers Mozambique's power and transportation situation, communications system, finance and foreign trade problems, marketing set-up, and diplomatic representation between Mozambique and the United States.

#### NETS:

Net Repair Manual, by Stacy V. Gebhards, 23 pp., illus., processed, 1964. Idaho Fish and Game Dept., 518 Front St., Boise, Idaho. Although most nets today are machine-tied and are purchased readymade from various companies, net repair must still be done by hand. A properly mended net can mean the difference between catching many fish or none at all. The intent of this manual is merely to acquaint the beginner with the proper procedure. Proficiency in mending can come only through practice. The manual covers trimming, weaving, section replacement, hanging, and maintenance of nets.

#### NORTHWEST ATLANTIC FISHERIES COMMISSION:

List of Vessels over 50 Gross Tons Fishing in the ICNAF Convention Area in 1962, 123 pp., illus., processed, January 1964. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada.

North Atlantic Fish Marking Symposium, Woods Hole, Mass., May 1961, Special Publication No. 4, 370 pp., illus., printed, 1963. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada.

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## NORWAY:

"A industria de conservas de peixe Norueguesa em 1963" (The Norwegian fish canning industry in 1963), article, *Conservas de Peixe*, vol. 18, no. 216, March 1964, pp. 15-17, 28, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

## NORWAY LOBSTERS:

"Handling and processing Norway lobsters. Part 1--Observations on handling and processing; Part 2--Washing experiments," by P. Hovart and W. Vyncke, article, *Fishing News International*, vol. 3, no. 2, April-June 1964, pp. 117, 119, 121-122, 125, illus., printed, single copy 6s. 6d. (about 85 U.S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The work reported here was carried out as part of the research program of the Committee for Applied Scientific Research in Fisheries, Fisheries Research Station, Ostend, Belgium. These are the first two parts of a four-part article. The aim of the work was a contribution to the improvement of the handling and processing of Norway lobsters (a shrimp-like crustacean) in commercial plants. In the meantime, it was intended to study the possibilities of cooking the lobsters on the vessels directly after catching. To study the influence of some important factors on the washing effect, three series of experiments were carried out, each being repeated three times on different dates and with different samples. In particular, the influence of dipping time, water temperature, soaking before washing and hosing were studied.

## OCEANOGRAPHY:

*Journal du Conseil*, vol. 28, no. 3, March 1964, 127 pp., illus., printed, single copy Kr. 16 (about US\$2.35). Andr. Fred. Høst & Son, Bredgade, Copenhagen, Denmark. Contains, among others, articles on: "A temperature-controlled salt-water circulating apparatus for developing fish eggs and larvae," by William E. Fahy; "Age determination in the whiting (*Merlangius merlangus* L.) by means of otoliths," by R. Gambell and J. Messtorff; "On the influence of the fishery upon the population structure of redfish (*Sebastes marinus* L. and *Sebastes mentella* Travin), by V. P. Sorokin; "The rational decision process in salmon migration," by Bernard C. Patten; "A comparison among selected marine species of an association between sea water temperature and relative abundance," by Robert L. Dow; and "Breeding and gonadal cycle of oysters in Loch Ryan, Scotland," by R. H. Miller.

*Oceanography and Marine Biology. An Annual Review*, vol. 1, edited by Harold Barnes, 478 pp., printed, 1963, 75s. (about US\$10.50). George Allen and Unwin, Ltd., 40 Museum St., London WC1, England.

U. S. S. R. *Oceanographic and Marine Studies*, OTS 63-1798, 73 pp., printed, September 20, 1963, \$2. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

## OREGON:

*Biennial Report to the Governor and the Fifty-Second Legislative Assembly, July 1, 1960-June 30, 1962*, 34 pp., illus., printed. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland

1, Oreg. How the Fish Commission is organized, what it is doing to discharge its statutory responsibilities to the resource and to the people of Oregon, and the highlights of its operation during the biennium from July 1, 1960, to June 30, 1962 form the basis of this report. It contains information on: work of the Administrative, Engineering, Research, and Fish Culture Divisions; the Service Recognition Program; Suggestion Awards Program; and other topics. Also included are statistical tables giving data on: liberations of salmon and steelhead trout into State waters; number of eggs taken at Fish Commission hatcheries; landings of food fish and shellfish; commercial fishing licenses issued; and fisheries law enforcement.

## OYSTERS:

"Winter hits the oyster industry," article, *New Scientist*, vol. 20, October 3, 1963, pp. 10-11, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

## PHYSIOLOGY:

"Measurements of swimming speeds of yellowfin tuna and wahoo," by Vladimir Walters and Harry L. Fierstine, article, *Nature*, vol. 202, no. 4928, April 11, 1964, pp. 208-209, illus., printed, single copy 4s. (about 60 U.S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

## PLANKTON:

"The wonderful world of plankton," by Donald J. Hall, article, *The Conservationist*, vol. 18, no. 5, April-May 1964, pp. 22-25, illus., printed. The Conservationist, Rm. 335, State Campus, Albany, N. Y.

## PORPOISES:

"On the experience gained in commercial fishing for porpoises," by A. I. Petrenko, article, *Rybnoe Khoziaistvo*, vol. 38, no. 3, 1962, pp. 44-48, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

## PREDATOR CONTROL:

"A method for the analysis of chlorinated benzenes in clams (*Mercenaria mercenaria*) and oysters (*Crassostrea virginica*), by N. Schwartz and others, article, *Journal of the Association of the Official Agricultural Chemists*, vol. 46, October 1963, pp. 893-898, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

## PRESERVATION:

*Handling and Preservation of Fish*, Report on the Work of Torry Research Station and Humber Laboratory, 24 pp., printed, 1962. Torry Research Station, Aberdeen, Scotland. Reviews the history and work of the Torry Research Station and its subsidiary, the Humber Laboratory, Hull, England. The Torry Station conducts research mainly in the fields of fish handling, processing, preservation, and transportation. The Humber Laboratory handles problems related to the distant-water fisheries and the Humber fishing ports. The two stations are fully integrated. Reference to work at Torry should be understood to include the Humber Laboratory as well.

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## PROTEIN:

"Fish hydrolysates. III--Influence of degree of hydrolysis on nutritive value," by N. V. Sripathy and others; "IV--Microbiological evaluation," by M. A. Krishnaswamy and N. L. Lahiry, articles, *Journal of Food Science*, vol. 28, May-June 1963, pp. 358-369, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Protein solubility as influenced by physiological conditions in the muscle," by R. N. Sayre and E. J. Briskey, article, *Journal of Food Science*, vol. 28, November-December 1963, pp. 675-679, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Proteins in fish muscle. 18--Sedimentation patterns of myosin-B extracts of prerigor cod muscle," by J. R. Dingle and others, article, *Canadian Journal of Biochemistry and Physiology*, vol. 41, September 1963, pp. 1915-1926, printed. National Research Council, Sussex St., Ottawa, Canada.

"Study of fish serum proteins by starch-gel electrophoresis," by Andree Drilhon, article, *Chemical Abstracts*, vol. 57, December 10, 1962, 15624d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

## QUALITY:

"Significance of the variations in the content of nucleotides, free amino acids, and carbohydrates of the fish muscle in judging quality," by F. Bramstedt, article, *Fette, Seifen, Anstrichmittel*, vol. 64, September 1962, pp. 820-825, printed in German. Industrieverlag von Hernhausen K. G., 24 Rodingsmarkt, Hamburg II, Germany.

"Sulfhydryl groups as an index of changes in fish tissue during refrigeration," by N. A. Golovkin and L. I. Pershina, article, *Chemical Abstracts*, vol. 56, June 25, 1962, 15894a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

## RADIATION PRESERVATION:

Low-Level Radiation Preservation of Fishery Products/October 1960-October 1962, by Joseph W. Slavin, Maynard A. Steinberg, and Thomas J. Connors, TID-12825, 37 pp., printed, April 1963, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Study of Irradiated-Pasteurized Fishery Products, October 1, 1962-September 30, 1963, by Joseph W. Slavin and Louis J. Ronisvalli, 82 pp., illus., printed, November 1963, \$2. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

## REFRIGERATION:

Refrigeration in Fishing Vessels, by G. C. Eddie, Torry Memoir No. 58, 8 pp., printed, 1961. Torry Research Station, Aberdeen, Scotland.

## RESOURCES:

Plan for Development of the Land and Water Resources of the Southeast River Basins, 183 pp.; Appendix 1--Savannah Basin, 211 pp.; Appendix 2--Ogeechee Basin, 146 pp.; Appendix 3--Altamaha Basin, 177 pp.; Appendix 4--Satilla-St. Marys Basin, 170 pp.;

Appendix 5--Suwannee Basin, 159 pp.; Appendix 6--Ochlockonee Basin, 183 pp.; Appendix 7--Apalachicola-Chattahoochee-Flint Basins, 226 pp.; Appendix 8--Chocotawhatchee-Perdido Basins, 176 pp.; Appendix 9--Economics, 243 pp.; Appendices 10 & 11--Hydrology; Engineering and Cost, 145 pp.; Appendices 12 & 13--Planning; History and Organization of the Commission, 276 pp.; illus., printed, 1963. United States Study Commission, Southeast River Basins, Box 953, Atlanta 1, Ga.

## SALMON:

"Eight progress report on salmon diet experiments," by Thomas B. McKee and others, article, *Research Briefs*, vol. 9, no. 1, May 1963, pp. 52-56, printed. Fish Commission, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Ore. 97201.

"Ninth progress report on salmon diet experiments," by Wallace F. Hublou and others, article, *Research Briefs*, vol. 9, no. 1, May 1963, pp. 57-62, printed. Fish Commission, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Ore. 97201.

The Salmon King of Oregon (R. D. Hume and the Pacific Fisheries), by Gordon B. Dodds, 271 pp., illus., printed, 1959, \$6. The University of North Carolina Press, Chapel Hill, N. C. This year (1964) marked the designation of the site of the first Pacific Coast salmon cannery (built in Sacramento, Calif., 100 years ago) as a National Historic Landmark. Because of the renewed interest in the early history of the Pacific Northwest salmon canning industry, it is fitting that attention be called to this book even though it was published several years ago. This is not really a full biography because, as the author points out, the necessary records are missing. But it is an economic history of the salmon canning industry in Oregon. Hume was a salmon canner of prominence and an early apostle of conservation. He was a member of the pioneer family in the salmon industry and an innovator in developing the techniques of the trade. The author admits that the scale of Hume's operations was much smaller than that of his competitors on the Columbia River, but his problems were the same as those of the larger cannery operators. It seems that the vicissitudes facing the salmon canner today are still exactly the same as those facing Hume: relentless competition; the search for larger domestic and foreign markets; relations with distant commission men; the supply of salmon; and securing of labor. But Hume had one more problem which no longer faces today's canner--the difficulty of manufacturing reliable cans. You will find on reading this book that Hume's solutions to the problems mentioned "were vigorous, imaginative and colorful." What Hume lacked in scientific knowledge of salmon he made up with inventiveness. Some of the first experiments in the artificial propagation of salmon were conducted in his own hatcheries. Hume erected an economic complex on the Rogue River in southwestern Oregon based upon his control of fishing rights on the river. Hume's career is significant not only because of what he himself accomplished, but also because it exemplifies so well the beliefs of his era in mechanical inventiveness, economic monopoly, progress, and the sanctity of wealth and business. The chapters in the book deal with Hume's migration from Maine to the Columbia, and to Oregon; the Rogue River salmon; the monopoly Hume developed; Hume

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the politician; the trials of a hatcheryman; his attempts to influence public opinion and to expand his empire; and the last chapter discusses the man and the times he lived in. Quite interesting is the appendix which gives the salmon pack on the Rogue River from 1877 through 1908. The book contains a good bibliography, and an index. This study tries to fill some gaps in American economic history, more specifically the activities of the frontier capitalist and businessman-conservationist in developing the salmon canning industry of the Pacific Northwest. Here is a book that makes fascinating reading. It is an excellent addition to the library of any one interested in the early history of commercial salmon fishing and canning.

--Joseph Pilleggi

#### SALT FISH:

"Accelerated cooling of wet, heavily salted fish," by A. L. Wood, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, July 1963, pp. 997-1,000, printed, Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### SANITATION:

"Bacteriological survey of filleting processes in the Pacific Northwest. I--Comparison of methods of sampling fish for bacterial counts," by Wayne I. Treitsvén, article, *Journal of Milk and Food Technology*, vol. 26, September 1963, pp. 302-306, printed, International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

"Increase in resistant strains on fish container during CTC-icing, and reduction of bacterial load on wooden container with bactericides," by Tetuo Tomiyama, Yasuo Yone, and Etsuko Shiraishi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, October 1962, pp. 1028-1042, printed, Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

#### SARDINES:

"Night-caught and day-caught larvae of the California sardine," by John D. Isaacs, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1132-1133, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### SAURY:

"Phototaxis of saury. I--Vitamin A of fish eye," by Yarkuro Yamamura and Seichiro Muto, article, *Chemical Abstracts*, vol. 59, November 11, 1963, 11942f, printed, The American Chemical Society, 1155 16th St. NW., Washington, D. C.

#### SEAWEED:

"Studies on soluble alginates. II--The pH of soluble alginates including lithium alginate, sodium alginate, potassium alginate and ammonium alginate," by Miki Oguro, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 12, May 1961, pp. 88-92, printed, Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### SHARKS:

"Composition and palatability of porbeagle flesh," by W. J. Dyer and D. I. Fraser, article, *Journal of the*

*Fisheries Research Board of Canada*, vol. 20, September 1963, pp. 1153-1158, printed, Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### SHRIMP:

"Occurrence of two penaeid shrimps, *Artemisia longinaria* (Bate) and *Hymenopenaeus mulleri* (Bate), and some lesser-known shrimps in coastal waters of South America," by M. N. Mistakidis and G. de S. Neiva, article, *Nature*, vol. 202, no. 4931, May 2, 1964, pp. 471-472, printed, St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

#### SMALL BUSINESS MANAGEMENT:

"Management Staffing in Small Business," by Howard V. Finston and Karl Christman, *Management Research Summary*, 2 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416. The study reported in this summary examines the practices followed in the selection, development, and retention of executives by some rapidly growing small businesses in New Mexico.

"Success or Failure of New Small Manufacturers," by William M. Hoad and Peter Rosko, *Management Research Summary*, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Why do some new manufacturers succeed while others fail? The study reported in this summary sought answers to this question in a 3-year study of 95 new small manufacturing businesses. Successful firms were often characterized by (1) two or more executives with different backgrounds; (2) experienced management--five years or more in managerial functions; (3) highly educated management; (4) consultations before and after starting the business; (5) use of management tools such as budgets and controls; and (6) establishment of definite, realistic objectives before committing funds. Failure was often caused by inadequate training, experience, or ability on the part of the management.

"Using Security to Get a Bank Loan," by Leonard J. Konopa, *Small Marketers' Aid No. 102*, 4 pp., processed, April 1964. Small Business Administration, Washington, D. C. 20416. Sometimes the small marketer's signature is the only security the bank needs when making a loan. At other times, the bank requires additional assurance that the money will be repaid. The kind and amount of security depends on the bank and on the small business owner's situation. Among the types of security discussed in this report are: endorser, comakers, and guarantors; assignment of leases; trust receipts for floor planning; savings accounts; and life insurance policies.

#### SPAIN:

"Nombres vulgares y científicos de las principales especies comerciales de peces de la región sudatlántica española (Common and scientific names of the principal commercial fish species of Spain's South Atlantic coast)," by Julio Rodríguez-Roda, 17 pp., illus., printed in Spanish, 1960. (Reprinted from *Investigación Pesquera*, vol. 22, November 1960, pp. 109-125.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

#### SPOILAGE:

"Bacteriology of spoilage of fish muscle. II--Incidence of spoilers during spoilage," by R. Adams, L. Farber,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

and P. Lerke, article, *Applied Microbiology*, vol. 12, no. 3, May 1964, pp. 277-279, illus., printed, single copy \$3. The Williams & Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202.

"Factors influencing the keeping quality of fresh-water fish in ice," by N. L. Lahiry, M. N. Moorjani, and B. R. Baliga, article, *Food Technology*, vol. 17, September 1963, pp. 123-125, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

#### STERN TRAWLERS:

"Fishing equipment and technique for a refrigerated stern trawler," by F. W. Jenckel, article, *Schiffbautechnik*, vol. 12, 1962, pp. 540-555, printed in German. VEB Verlag Technik, 13/14 Oranienburgerstrasse, Berlin C2, Germany.

"Refrigerated stern trawler," article, *Schiff und Hafen*, vol. 14, no. 10, 1962, pp. 867-888, printed in German. C. D. C. Heydorns Buchdruckerei, Ueter-ssen bei Hamburg, Germany.

#### STRIPED BASS:

"Hopes high for striped bass hatchery," by Otho May, article, *South Carolina Wildlife*, vol. 11, no. 2, Spring 1964, pp. 14-15, illus., printed. South Carolina Wildlife Resources Department, Box 360, Columbia, S. C.

#### TOXICITY:

"Separation and purification of toxic constituent of swellfish," article, *Chemical Abstracts*, vol. 56, April 2, 1964, 7684a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Source of paralytic shellfish toxin in the Bay of Fundy," by A. Prakash, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, July 1963, pp. 983-996, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies on the food poisoning caused by aquatic foods. I--Preliminary survey on toxic substance of octopus which caused food poisoning," by Yoshihiro Sato, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, March 1963, pp. 263-266, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

#### TOXINS:

"Tetrachotoxin-tetrodotoxin: A potent neurotoxin," by H. S. Mosher and others, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1100-1110, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. A nonprotein substance isolated from the California newt is the same as the toxin from the puffer fish.

#### TRAWL NETS:

The Study of the Mesh Selection of Trawl Nets, with Special Reference to the Mesh Regulation on the Japanese Trawl Fishery in the East China and the Yellow Seas, by Tsunoe Aoyama, Fisheries Research Series No. 2, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

#### TROUT:

"Fat oxidation and storage life of iced trout. I--Influence of gutting," by Poul Hansen, article, *Journal of the Science of Food and Agriculture*, vol. 14, November 1963, pp. 781-786, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

#### TUNA:

"Biochemical studies on tuna. IV--Effect of cold storage on the base composition of testis deoxyribonucleic acid (DNA)," by Yutaka Fuji, Koichi Mimoto, and Shichiro Higasa, article, *Chemical Abstracts*, vol. 57, November 26, 1962, 14301a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Biologia del Atun, THUNNUS THYNNUS (L.) de la costa sudatlantica de Espana (Biology of the bluefin tuna, *Thunnus thynnus* (L.), of Spain's South Atlantic coast), by Julio Rodriguez-Roda, 114 pp., illus., printed in Spanish with English summary, 1964. (Reprinted from *Investigacion Pesquera*, vol. 25, January 1964, pp. 33-145.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

#### TUNALIKE FISH:

Japansk Bonito- og Tunafiske (Japanese Bonito and Tuna Fishing), by Torolf Holme, *Fiskeridirektoratets Skrifter, Serie Fiskeri*, vol. 5, no. 1, 1964, 77 pp., illus., printed in Norwegian with English summary. A. S. John Griegs Boktrykkeri, Bergen, Norway.

#### U. S. S. R.:

Rybnoe Khoziaistvo, vol. 40, no. 4, April 1964, 95 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U. S. S. R. Includes, among others, these articles: "Basic trends of technical progress in the fishing industry during 1966-1970," "Biology and fisheries for basic fishes of southern Atlantic," by S. O. Overko; "Fishing areas off eastern Greenland," by L. N. Pechenik and M. V. Mina; "Present condition and future development of fishery ports," by I. A. Kunitskii; "Ocean perch and herring trawl operations of the SRTR Uliss," by G. Grishchenko; "Use of electric current in the harvesting of seals," by B. I. Badamshin and others; "Gleb Uspenskii, a large stern trawler," "Agar from Black Sea gelidium algae," by A. A. Kalugina; "The fishing industry of the U. S.," by A. B. Kuz'mychev; and "Second session of the Mixed Commission on Cooperation in Marine Fisheries (Soviet Union, Poland, and East Germany)."

--M. A. Kravanja

Rybnoe Khoziaistvo, vol. 40, no. 5, May 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U. S. S. R. Includes, among others, these articles: "The development of a large chemical industry and technical progress in the fishing industry," by V. P. Zaitsev; "Our first experience with new fishery regulations," by E. N. Kazanchev; "The characteristics of fishing for white whales and regularity of their distribution in the Arctic," by D. A. Butorin; "Purse-seining for halibut and other bottomfish in the waters off Kamchatka,"

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by I. A. Polutov and others; "Selection of infrared thermo-emanator in warm processing of fish," by N. N. Sakharova and E. I. Mellekh; "Objective method of determining the degree of fat acidity in salted herring," by L. A. Liubavina; "Chemical composition and possible processing techniques for Far Eastern molluscs," by D. Ia. Ertel; "Possibilities of increasing the efficiency of operation of large stern trawlers (BMRT)," by N. S. Iukhno and V. A. Teplitskii; "Soviet-Ghanaian agreement on cooperation in marine fisheries;" and "Physical principles of fish detection," by I. Kliukin.

--M. A. Kravanja

#### VIET-NAM:

Foreign Trade Regulations of Viet-Nam, by Nandor J. Chepio, OBR 64-49, 8 pp., printed, May 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Viet-Nam's chronic imbalances in foreign trade, low level of exchange reserves, and need to stimulate industrialization are important factors in the Government's restrictive trade policy. This report contains information on the import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also discusses nontariff import trade controls, Viet-Nam's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### VITAMIN A:

"Effect of processing on the vitamin A content of some Nile fishes," by S. R. Norcos and M. K. Saleh, article, Chemical Abstracts, vol. 59, August 5, 1963, 3261b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

"Studies on the mechanism of consumption and accumulation of vitamin A in fish (Part II)," by Yarakuro Yamamura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 39-44, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

#### WHALE OIL:

"Food additives. Hydrogenated sperm oil," article, Chemical Abstracts, vol. 57, December 10, 1962, 17144b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

#### WHALES:

"Flavour of beef and whale meat," by Irwin Hornstein, Patrick F. Crowe, and William L. Sulzbacher, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 1252-1254, printed. St. Martin's Press, Inc., 175 Fifth Ave., New York, N.Y. 10010.

"Movement of humpback whales marked in the South West Pacific Ocean 1952 to 1962," by W. H. Dawbin, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 68, 70-74, 76-78, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

"Properties of components of myoglobin of the sperm whale," by M. Z. Atassi, article, Nature, vol. 202, no. 4931, May 2, 1964, pp. 496-498, illus., printed. St. Martin's Press, Inc., 175 Fifth Ave., New York, N.Y. 10010.

"Reprocessing of whale fat into edible hydrogenated fat," by T. A. Khorin, article, Chemical Abstracts, vol. 58, January 7, 1963, 876e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

#### WHALING:

"Antarctic season 1963/64," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 78, 80-81, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. In the season 1963/64, 16 factoryships took part in pelagic whaling operations in the Antarctic. This was one less than in the previous season; the British factoryship Southern Harvester, sold in 1963 to Japan, did not participate in the operations. The International Whaling Commission had resolved at its meeting in 1963 to give total protection to the blue whale in all but one Antarctic area. The humpback whale was totally protected. Further, the Commission fixed the maximum catch for season 1963/64 at 10,000 blue-whale units, where the "ceiling" had been 15,000 units in the previous season. The season lasted from December 12 to April 7 for fin and sei whales, and from February 1 to April 7 for blue whales. Included in this article are statistical tables showing the Antarctic catch by country in the past 3 seasons; catch by blue-whale units, 1963/64; blue whale catches for the past 3 seasons; and production of whale and sperm oil by fleet.

#### YELLOWTAIL:

Notes on the Ecology and Fisheries of the Yellowtail SERIOLA QUINQUERADIATA T. et S., of the Japanese Waters, by Fumio Mitani, Fisheries Research Series No. 1, 43 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.



### "RIVERS OF MUD" AT BOTTOM OF SEA

A series of mammoth "sea channels" carved out of the bottom of the ocean by gigantic "rivers of mud" have been found by United States scientists. Their findings were made public on July 26, 1964, by the Director of the Coast and Geodetic Survey (C. & G. S.), U. S. Department of Commerce. He reported that the "sea channels" were located in the Bay of Bengal.

The findings resulted from a study made by the C. & G. S. oceanographic research vessel Pioneer. The 312-foot "floating laboratory" is participating in a 20-nation study of the Indian Ocean, scientifically one of the least known areas of the world. Its 27,000-mile cruise ended August 11 when it returned to its home base of Oakland, Calif., after an absence of six months.

The study was conducted by three oceanographers--2 from the Coast and Geodetic Survey, and 1 from the Scripps Institution of Oceanography. They reported that at least a score of the "sea channels" was discovered on the bottom of the Bay of Bengal off the southern coast of India.

"These channels are of enormous dimensions," said one of the oceanographers. "The largest surveyed by our scientists, located about 2 miles below the surface of the sea, was about 4 miles wide and 300 feet deep. We estimated that it carried a volume of water 25 times larger than that of the Mississippi River. We followed it for about 200 miles before we lost it." The Mississippi River is about a mile wide and up to 50 feet deep. The oceanographer said the channels were apparently dug out of the sea bottom by "gigantic rivers of mud."

"Over the years," he said, "the many rivers which pour into the Bay of Bengal, including the Ganges, Irrawaddy, and Brahmaputra, deposit their mud on the continental shelves, a connecting link with the ocean bottom which begins at the water's edge. Possibly about once or twice each century, this mud suddenly moves with compelling force from the shelves across the bottom of the sea through these huge channels. What triggers these sudden avalanches of mud at the bottom of the sea is not known."

"But the mud is apparently funneled down submarine channels cut into the steep continental slopes, which link the continental shelves and the ocean bottom, and pours across the almost flat sea floor for hundreds of miles. At some time in the distant past, the mud avalanches cut these enormous channels out of the sea bottom."

"Each time this unusual phenomenon occurs, it fills the sea channels to overflowing with huge, massive, fluid rivers of mud. The volume is so great that in overflowing the channels it builds its own levees or walls, just as the Mississippi River does on land. These mud rivers run along the bottom of the sea like a flood of mercury. We don't know how long these avalanches last. We believe they travel at high speed and their volume is measured in millions of cubic yards of mud. They represent a truly remarkable phenomena of the sea."

The C. & G. S. oceanographer said the channels are to be found as far as 500 miles from shore.

Scientists knew before that deep-sea floor channels existed, but the impression up to now has been that they represented a series of structural faults in the ocean bottom. Only a few had been located in the Bay of Bengal.

"Our study definitely established," declared the scientist, "that these channels are not structural faults, that they were caused by rivers of mud, that they represent a complex system rather than the isolated 2 or 3 we believed existed before. These sea channels in the Bay of Bengal represent the greatest network and the greatest display of these unusual features found anywhere so far. This is undoubtedly one of the major discoveries of our expedition."

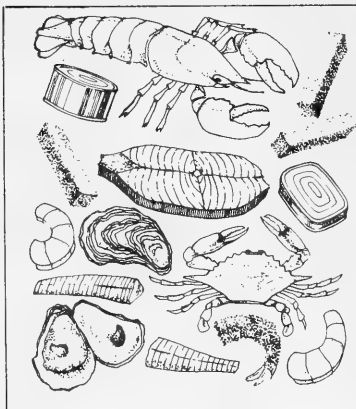
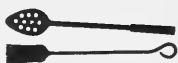
The Pioneer spent two weeks studying the sea channels. (News Release, July 26, 1964, Coast and Geodetic Survey, U. S. Department of Commerce.)



the 1990s, the number of people in the United States who are 65 years of age or older has increased by 50% (U.S. Census Bureau, 2000). The number of people aged 65 and older is projected to increase to 20% of the total population by the year 2020 (U.S. Census Bureau, 2000). The increase in the number of people aged 65 and older is expected to be even more dramatic in other countries. For example, the number of people aged 65 and older in Japan is projected to increase from 15% of the total population in 1990 to 25% of the total population by the year 2020 (U.S. Census Bureau, 2000). The increase in the number of people aged 65 and older is expected to be even more dramatic in other countries. For example, the number of people aged 65 and older in Japan is projected to increase from 15% of the total population in 1990 to 25% of the total population by the year 2020 (U.S. Census Bureau, 2000).

1990

# Fish and Shellfish Cookery



**1 ..... BASIC FISH COOKERY.** Looking for ways to prepare seafood? This booklet provides step-by-step illustrations, taking you from the cleaning and preparation of seafood through methods of cooking, to the final dish ready to place on the table. It discusses the nutritive value of the various types of seafood; presents a guide for buying fish and shellfish; gives many basic recipes for frying, broiling, baking, planking, boiling, and steaming seafood; and lists many garnishes that may be used to enhance these dishes. 1956 26 p. il.

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**Fish and Wildlife Service**  
**Bureau of Commercial Fisheries**  
**Washington, D.C.**





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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# COMMERCIAL FISHERIES REVIEW

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## A PROGRESS REPORT ON THE DEVELOPMENT OF INTERNATIONAL FOOD STANDARDS

By Charles Butler\*

Among the first problems facing any country seeking to engage in international trade is that of agreement with the buyer on the nature, characteristics, quality, quantity, and price of the commodity to be traded. Once agreement is reached on those elements, the negotiation of the other details can proceed in an orderly way and by accepted rules of commerce.

Many countries are actively engaged in the export and import of foods whether they be raw, semiprocessed, or processed. However, that trade is hampered by lack of food standards acceptable to buyer and seller. A number of international organizations had been working on standards for trade between countries. For example, the need for agreement on food standards was first recognized when the Codex Alimentarius Europaeus was established to develop standards for use among European nations. The Organization for Economic Cooperation and Development (OECD), of which the United States is a member, also had a program for food standards development.

Many people felt that the work was being unnecessarily duplicated, too many organizations were engaged in it, and its cost was becoming prohibitive. This situation sparked the adoption of a resolution at the FAO Conference of 1961, endorsing the establishment of a Codex Alimentarius (Food Standards) Commission to operate under joint Food and Agriculture Organization/World Health Organization (FAO/WHO) auspices. The excellent progress made on food additives, milk hygiene, and the Code of Principles for milk and milk products under this same joint auspices was the basis for this further program. In October 1962, there was convened, at Geneva, the First Joint FAO/WHO Conference on Food Standards to review the proposed program. The conference was mainly concerned with the organization of the FAO/WHO Codex Alimentarius Commission. The attendees set the principles, guidelines, purpose, and scope of the Commission.

The first working conference of that Commission, held in Rome June 25-July 3, 1963, resulted in assignment of chairmanships of the various commodity and practices committees to

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Fig. 1 - To assure a top-quality processed product for the consumer, U. S. D. I. (U. S. Department of the Interior) fishery inspector checks quality of raw heads-off shrimp in Texas shrimp breeding plant.

member governments or international organizations. For example, the United States was assigned chairmanships for the committees on food hygiene and processed fruits and vegetables; FAO was given the chairmanship for the committee on fish and fishery products.

The Joint FAO/WHO Program on Food Standards (Codex Alimentarius) has as its purpose: simplifying and integrating food standards work now carried on by many international organizations; providing an effective mechanism for obtaining Government acceptance of those standards; and their publication in the Codex Alimentarius. Participation in the program is open to all interested member nations of FAO and WHO. Primary task of the Commission is the determination of priorities and the allocation of preparatory work on each standard to the best qualified outside technical body. The group so selected would submit a draft to the Commission for finalization at Government level as was so successfully done with the Code of Principles for Milk and Milk Products. Work already under way on food standards, such as that



Fig. 2 - U. S. D. I. fishery inspectors at packing line of Texas shrimp breeding plant.

of FAO, would gradually be integrated with the new Joint Program. Basis for the Joint Program is (1) the rapidly growing importance of internationally accepted food standards as a means of protecting consumers and producers in all countries, whatever their stage of development, and of effectively reducing trade barriers; and (2) the need to simplify and integrate international food standards work to avoid duplication and conflicting standards and to effect economies in effort and expense.

Types of foods to be included are principal foods entering international trade, whether processed, semiprocessed, or raw, for direct sale to the consumer or for manufacturing purposes. Food additives, intentional or unintentional, are included because of their increasing importance (pesticides, etc.). Primary responsibility for the work on food standards rests with FAO, while WHO is concerned with health aspects of the program. Food hygiene is included because this element is essential to insure a food standard that is both effective and acceptable, based on international food standards work already under way. Food hygiene rules will also be valuable for guidance of developing countries where full knowledge in this area cannot be taken for granted.

Worldwide standards were agreed upon as the desirable type, because some foods are international in trade. There are not excluded standards for foods that are regional or international but the Codex, through incorporation of both types, will be a reference book of international food standards and a means for harmonizing the standards themselves.

The nature and type of standards to be included in the Codex is important. "Nature" means the category into which they fall. These are: international "trading" standards; international minimum standards, standards somewhat less rigorous, but a target at which national standards should aim. "Type" is aspect to be covered; composition, designation, labeling, analysis, hygiene, etc.

The Commission recognizes the difficulty of attaining its objectives, even for closely linked countries, but the aim must be attained by any group of countries seeking free interchange of foodstuffs in a common market. The trading standards can be only recommendations for use by any country at its option; or as in EEC, by international legislation they may become law for that group. Less difficult is the recommendation of minimum standards which if a government accepts them, merely undertakes to insure that corresponding national standards shall not be less rigorous. This does not preclude national standards being more rigorous.

A good example of minimum standards appeared in Code of Principles for Milk and Milk Products, now accepted by about 50 countries. Standards for dried milk, elaborated therefrom, are already having international impact on trade in that commodity.

Those food standards are aimed at insuring the marketing of a sound, wholesome product, correctly labeled and presented. Those objectives are most important in international standards. They are not intended to force a certain quality (or grade) of product upon the consumer or otherwise to affect consumer preference.

All standards developed by the Commission would be submitted to governments with a view to their acceptance. This is an essential element since there are detailed and diverse governmental regulations to which every imported food must comply. Harmonization with national standards, therefore, will enhance the weight of the Codex standard as a model.

For fish and fishery products, the Commission delegated to FAO the initial work on both Codes of Principles and Standards. FAO called a meeting of a Committee of Experts which met in Rome, February 18-20, 1964.

The Committee consisted of experts from the following 12 countries actively associated with international trade in fish and fishery products: Canada, Denmark, Federal Republic of Germany, Iceland, Italy, Japan, Netherlands, Norway, Poland, Portugal, United Kingdom, and United States of America, together with observers from France, Poland, the Organization for Economic Cooperation and Development (OECD), and the European Economic Community (EEC). The Committee elected as its Chairman H. V. Dempsey (Canada) and as its Rapporteur C. Butler (U. S. A.)

The Committee's substantive agenda was as follows:

- (1) Recommendation of priorities among fish and fishery products to be standardized.
- (2) Preparation of a code of principles for fish and fishery products.
- (3) Preparation of a draft model standard.

In handling this agenda, the Committee had before it a considerable documentation prepared by the FAO Secretariat, containing information on regulations concerning fish and fishery products in the principal countries, on the work of other international agencies (in particular OECD) on a draft skeleton code of principles and, finally, material on international trade in fish and fishery products to facilitate the selection of priorities among them for standardization.

The Committee agreed that, in the selection of products for international standardization, priority should be given to those products:

- a. Which are important in international trade.
- b. Which are of interest to a number of countries.
- c. Where lack of standards have created trade difficulties.
- d. For which raw material does not differ too much.
- e. For which standardization would not be too difficult technically.

The list of products selected as suitable for international standardization at an early date was:

(a) Canned Products:

Herring and sardine in tomato sauce  
Herring and sardine in oils  
Tuna, bonito and mackerel in brine or oils  
Pacific salmon  
Crab meat and shrimp

(b) Frozen Products:

Tuna as raw material for further processing  
Herring " " " " " "  
Fillets of Atlantic cod, haddock, and ocean perch (Sebastes species)  
Pacific salmon  
Crustaceans

(c) Cured Products:

Salted herring  
Salted cod

Instead of the Code of Principles which it was requested to draw up, the Committee felt that it would be more descriptive to call it a Code of Practice, since what was wanted were broad guidelines for practical application. On the basis of a draft submitted by the Secretariat, the Committee considered in detail the various chapters which should be included and, as a result, drew up the skeleton Code of Practice which is outlined here:

I. HANDLING PRACTICES FOR RAW MATERIAL

1. Requirements for raw fish and fishery products

(a) Handling on board fishing vessels

- (i) condition of fish at the time of catching
- (ii) immediate handling of fish, including gutting and bleeding
- (iii) washing
- (iv) stowing and icing
- (v) equipment and facilities available on board (boxes, freezing equipment, cold-storage rooms, etc.)

(b) Handling ashore

- (i) proper methods of unloading the catch
- (ii) re-icing prior to sale as fresh fish
- (iii) re-icing prior to processing
- (iv) re-icing prior to auction
- (v) handling of products frozen at sea

2. Requirements for plants and equipment

- (a) sanitation
- (b) disinfection

II. PROCESSING PRACTICES

- 1. Freezing and storage of frozen products
- 2. Canning
- 3. Curing (salting, smoking, marinating)

### III. PRACTICES OF QUALITY CONTROL

#### IV. STANDARDS

##### 1. Standards of composition

- (a) definition
- (b) designation
- (c) quality requirements
- (d) permitted additions
- (e) marking and labeling

##### 2. Methods of sampling, analysis and examination needed for control of each standard

In general, the Committee felt that the Fisheries Division of FAO should be responsible for elaborating the skeleton Code of Practice. However, in order to achieve that task, the Committee felt that specified countries or organizations should be asked to help in the preparation of the Code. The exceptions are as follows:

a. With respect to antimicrobials and other ice additives, the Committee requested the Director-General to request the Codex Alimentarius Expert Committee on Food Additives, under the chairmanship of the Netherlands Government, to look into the whole question of the use of antibiotics in ice for the preservation of fish with a view to determining whether the technological considerations are sufficient to justify the establishment of a tolerance for their use, subject to appropriate toxicological examination by the Standing Joint FAO/WHO Expert Committee on Food Additives.

b. With respect to requirements for plants and equipment, the Committee recommended that the questions of sanitation and disinfection be considered by the Codex Alimentarius Expert Committee on Food Hygiene, under the chairmanship of the United States. The Committee, therefore, requested the Director-General to ask the Expert Committee on Food Hygiene to include in its program problems of sanitation and disinfection for fish processing plants.

c. With respect to freezing and storage of frozen products, the Committee felt that the International Institute of Refrigeration (IIR) should be requested to develop that chapter of the Code in collaboration with OECD.

d. With respect to processing practices for canning, the Committee noted the program now in hand with OECD on this subject and felt that OECD should be asked to develop that chapter of the Code.

e. With respect to curing, the Committee felt that this subject should be broken down into the following subdivisions and the development work allocated as indicated:



Fig. 3 - U. S. D. I. fishery inspector in Texas shrimp breeding plant checks package of breaded shrimp at weighing station of the production line.

<u>Process</u>	<u>Country</u>
Salting	Iceland
Smoking	Netherlands
Marinating	Germany

Regarding fermented products, it was agreed that this subject should be referred to the Indo-Pacific Fisheries Council for consideration and the development of a Code if they felt that sufficient material was available for a chapter.

The Committee considered in detail a skeleton model which had been drawn up by the FAO Secretariat for the elaboration of international standards for fish and fishery products. The model standard agreed upon is as follows:

# I. STANDARD OF COMPOSITION

(The example taken is that of a canned product).

## Definition

The fish shall be defined by the Latin name of the genus and species to which it belongs (Binominal nomenclature), e.g. "canned tuna is the processed flesh of fish of the species listed. . . ."

## Designation

Name of product e.g., grated tuna in oil.

## Quality requirements

### Minimum requirements for content

(a) requirements concerning fish, e.g., appearance, freshness, color, etc.

(b) form of pack, e.g., solid pack, chunks, flakes, grated

## Grades

e.g. Fancy Grade	or Grade A
Standard Grade	Grade B
Commercial Grade	

## Permitted additions

(a) substances added for other purposes (eventually food additives which will be included in the Codex Permitted List now in preparation).

(b) packing media, e.g., type of oil used, brine, etc.

(c) other ingredients.

## Marking and labeling

The outside of packages shall bear the following information clearly described:

(a) designation - e.g. chunks

(b) ingredients

(c) weight or count

(d) origin of finished product - e. g. country, manufacturer, packer, etc.

## II. METHODS OF SAMPLING, ANALYSIS AND EXAMINATION NEEDED FOR CONTROL OF THIS STANDARD

(a) examination of cans - e. g. seaming

(b) bacteriological examination - e. g. routine incubation

(c) chemical examination - e. g. salt, fat, acidity

(d) organoleptic examination

(e) sampling

The Committee proposed that the following steps should be followed in drafting standards on this model:

a. A first draft would be prepared by the "author" country or organization proposed in the following table against each standard (if the FAO Secretariat should be unable to make the arrangements suggested with those countries or organizations, the Committee urged it to make such other appropriate arrangements as might be necessary to expedite this work) and sent to the FAO Fisheries Division which would then distribute it for comment to other interested countries.

b. The comments of those countries would then be sent to the FAO Secretariat for consolidation and transmission to the "author" country.

c. The "author" country or organization would then prepare a revised draft in the light of the comments and send it to the FAO Secretariat.

d. The second draft would then be distributed by the Secretariat to interested countries for further comment.

e. This procedure would be continued until substantial agreement had been reached upon the draft.

f. At that stage, the Committee felt that the draft could best be considered by a Codex Alimentarius Expert Committee which the Codex Alimentarius Commission might wish to set up.

g. The draft approved by that Committee of Experts would then be sent to the Codex Alimentarius Commission and thereafter handled by the normal agreed procedures of that Commission.

The countries or organizations which the Committee felt should be invited to undertake the preparation of the preliminary draft of the standards (i. e. "author" countries or organizations) are as follows:

### CANNED PRODUCTS

### "AUTHOR" COUNTRY

Herring in tomato sauce  
Sardine in tomato sauce  
Herring in oil  
Sardine in oil  
Tuna in brine or oil  
Bonito in brine or oil

OECD  
OECD  
OECD  
OECD  
Japan  
Peru

CANNED PRODUCTS (Contd.)

Mackerel in brine or oil  
 Pacific salmon  
 Shrimp: (i) Paeneus  
 (ii) Crangon

"AUTHOR" COUNTRY (Contd.)

Portugal  
 Canada  
 U. S. A.  
 Federal Republic  
 of Germany

FROZEN PRODUCTS

Frozen tuna as raw material  
 for further processing  
 Frozen herring as raw material  
 for further processing  
 Frozen fillets of Atlantic cod,  
 haddock, and ocean perch (Sebastes)  
 Frozen Pacific salmon  
 Frozen crustaceans

Japan  
 Norway  
 United Kingdom  
 Canada  
 France

CURED PRODUCTS

Salted herring  
 Salted cod, etc.

Netherl nds  
 Canada

The Committee requested the Secretariat, when inviting countries or organizations to draft those standards to seek as far as possible "trading" standards. "Trading" standards are for purposes of aiding in orderly trade in the commodity as contrasted to consumer-oriented standards. They aim at establishing a norm for the commodity, but do not preclude negotiation for sale of a below-the-norm commodity at a lesser price.



Fig. 4 - U. S. D. I. fishery inspector in a Texas shrimp breeding plant checks the grade of breaded shrimp.

The United States Government has supported the Codex Alimentarius Commission from its inception and has taken an active role. In fact, Deputy Commissioner John Harvey of the Food and Drug Administration chaired that Commission's meeting at Geneva in February 1963, and at Rome in June of 1963. Since the United States has a rather comprehensive program of national food standards it is in a position to provide a significant impact for the development of international "trading" standards. Those standards will help the United States in its current program of trade expansion abroad, and they will also provide guidelines for production by developing countries of products acceptable in world trade channels.

The fishing industry should be interested in the program in that it will have a bearing on our export and import business in the future. The procedures described provide ample opportunity for comment on the fishery products standards as they are developed. The acceptance of any standard published by the Codex Alimentarius Commission for use is entirely voluntary and each country can elect to use it or not. However, with these new international tools there is reason to believe the goals set down by the Commission can be reached:

1. Promotion of trade in food.
2. Stimulation of food standards work in developing countries.



3. Protection of the consumer's health.
4. Promotion of fair practices in food trade.

## BIBLIOGRAPHY

1962. Report of Joint FAO/WHO Conference on Food Standards, Geneva, October.

1963. Report of First Session of Joint FAO/WHO Codex Alimentarius Commission, Rome, Italy, July.

1964. Report of Joint FAO/WHO Codex Alimentarius Commission Committee of Experts on International Standards for Fish and Fishery Products, Rome, Italy, February 18-20.



## THE TRUE DOLPHIN KNOWN FOR SPEED AND FIGHTING SPIRIT

Two marine species in the waters of the Gulf of Mexico have the same name--dolphin. One is the bottle-nosed mammal sometimes called porpoise. The other is the true dolphin, a beautiful and spectacular game fish.



Dolphin or Dorado

The dolphin, or dorado, is resplendently colored with hues of lilac, sea greens and emerald pastels mingled with purplish golds. Leaping high into the air when snared, this fish displays those colors with each surge. These repeated leaps of 10 to 20 feet are remarkable demonstrations of the dolphin's fighting spirit.

Dolphins are most often caught by trolling slowly in rather deep waters off reefs or in bays. The young occur in shallow waters, but the mature fish usually prefer the open seas. These fish are noted for their very great speed and their streamlined body design. The average size dolphin is about 2 or 3 feet long, and they are said to prey on flyingfish.

Dolphins are also famed for unusual and rapid change of color at death. Their colors may change from yellow to green to blue to violet in a matter of minutes. (Alabama Conservation, December-January 1964.)

# TRENDS AND DEVELOPMENTS

## Alaska

### FOREIGN FISHING ACTIVITIES IN BERING SEA, JUNE 1964:

There was an increase in foreign fishing activity off Alaska during June 1964. By the end of that month, some 400 Soviet and Japanese vessels were fishing in the area.

**U. S. S. R.: KING CRAB FISHERY:** A tangle-net fishery for king crab was the only major Soviet effort in the eastern Bering Sea during June--an area of intense Soviet fisheries during the winter and early spring periods. The factoryships Pavel Chebotnyagin, Konstantin Sukhanov, and Vasily Blyukher, each accompanied by at least two tangle-net setting trawlers, were concentrating on the Continental Shelf north of the Alaska Peninsula from Unimak Pass to near Port Heiden. The limited Soviet fishery for shrimp located northwest of the Pribilof Islands during May 1964 had apparently been abandoned.

**TRAWL FISHERY:** The major Soviet fishery off Alaska had their trawling fleet fishing primarily for Pacific ocean perch in the Gulf of Alaska. That fishery, which began near Yakutat in March, shifted to the west with the major concentration during June centered on Albatross Bank south of Kodiak Island. About 90 trawlers, 15 freezer ships, 3 factoryships, and associated support vessels were included in the Albatross fleet. A smaller Soviet trawling fleet of about 25 trawlers and 4 freezer ships was operating on Portlock Bank east of Kodiak. Frequent observations of the catches by the Soviet trawling fleet near Kodiak continue to indicate they were taking large quantities of Pacific ocean perch, with very little incidental catches of other species such as halibut and king crab.

**WHALING:** In mid-June, the massive whale factoryship Sovetskaya Rossiya, accompanied by at least 11 whale killer vessels, was observed actively engaged in whaling off Cape Spencer in southeast Alaska. The Ros-



Fig. 1 - Soviet trawler operating in North Pacific and Bering Sea. Vessel under way with all nets aboard.

siya was built in 1961, is over 700 feet long, of 32,000 gross tons, and carries a helicopter aboard. It was believed she was returning from the whaling season in the Antarctic, taking additional whales en route to her home port of Vladivostok.

**Japan: SHRIMP FISHERY:** The Japanese factoryship Chichibu Maru, with 12 accom-

panying trawlers, which was engaged in a shrimp fishery generally north of the Pribilof Islands throughout the year was reported to have returned to Japan for repairs. She is scheduled to return to the eastern Bering Sea during August. A second shrimp factoryship, the Einin Maru, also with 12 trawlers, was still in the area generally north of the Pribilofs during June.

**KING CRAB FISHERY:** King crab fishing by the Japanese involving the factoryships Tokei Maru and Tainichi Maru was centered in the area off Port Moller during June. Each of the factoryships was accompanied by 6 trawler-type vessels for handling the tangle nets.

**LONG-LINE FISHERY:** The Japanese long-line fishery, specifically for halibut in the eastern Bering Sea, apparently was abandoned due to disappointing catches. At last report the Kotoshiro Maru No. 25 with one accompanying long-liner shifted its operations to near the Siberian coast. The factoryship Fuji Maru No. 3 was reported to have returned to Japan. The 5 long-line fishing vessels accompanying the Fuji Maru No. 3 were to be assigned to the Seifu Maru fleet.



Fig. 2 - Cleaning and packing compartment aboard a Japanese factoryship.

**FISH-MEAL FISHERY:** A total of 4 Japanese fish-meal and oil producing fleets were operating in the eastern Bering Sea during June. The factoryships Hoyo Maru and Gyokuei Maru, with 30 trawlers assigned to each, were operating on the "flats" of outer Bristol Bay from Unimak Pass to the area east of the Pribilof Islands. The factoryship Tenryo Maru with 28 trawlers was joined by another fish-meal and oil fleet of the factoryship Soyo Maru, also with 28 trawlers. Throughout most of June those 2 fleets have operated in

the general vicinity of Unimak Pass on the Bering Sea side. The factoryship Seifu Maru licensed with 28 trawler vessels also appeared near Unimak Pass in late May. Officials aboard the Seifu told members of a United States boarding party that their catches had been poor and that they were moving to the Siberian coast. The shift to other waters apparently had been made as the Seifu fleet was not sighted in the eastern Bering Sea during June.

**WHALING:** Whaling operations were conducted by 3 Japanese fleets near Alaska during June. The factoryship Kyokuyo Maru was believed to be operating near Amchitka Pass in the mid-Aleutians with another fleet, possibly the Nitto Maru, further eastward near Amukta Pass, west of Umnak Island. A whale killer, which in 1963 was assigned to the Kinjo Maru fleet, was sighted several times during June off southeast Alaska in the region generally west of Baranof Island.

**EXPLORATORY FISHING:** The Japanese trawlers Taiyo Maru No. 81 and Tenryu Maru "exploratory" fishing in the Gulf of Alaska during the month were joined by 2 others, the factory stern trawler Akebono Maru No. 51 and the smaller side trawler Kohoku Maru No. 2. Those 4 of 6 such vessels to engage in Gulf of Alaska "exploratory" fishing were concentrated in the area east of the Trinity Islands, southwest of Kodiak. The factory trawlers Akebono No. 51 and Taiyo No. 81 were reported seeking Pacific ocean perch primarily, while the side trawlers Tenryu and Kohoku No. 2 were mainly looking for shrimp.

\* \* \* \* \*

#### KODIAK FIRM PROCESSES DUNGENESS CRAB:

It was reported that a cold-storage plant in Kodiak would employ from 40 to 50 women to help process Dungeness crab at that plant. During June, 12 women were working at the shaking tables. The firm has been shipping large quantities of fresh cooked Dungeness crab meat to other states where the supply is limited.

\* \* \* \* \*

#### SOUTHEASTERN ALASKA SALMON PURSE-SEINE SEASON OPENED JULY 1:

The Alaska Department of Fish and Game announced in June that Districts 4, 12, and 14 were to be open for purse seining on July 1

for two days' fishing beginning at 6:00 a. m., July 1, and ending at 6:00 p. m., July 2. Test fishing had indicated that southeastern Alaska may have one of the best chum salmon seasons in recent years. Chum were the dominant species in almost all of the test fishing areas from Ketchikan to Icy Strait.

\*\*\*\*\*

#### HALIBUT PRICES RISE IN JUNE:

Halibut ex-vessel prices continued to rise in June at Ketchikan. Late ex-vessel sales were as high as 24.5 cents a pound for medium and large fish, and 12 cents for chicken halibut.

\*\*\*\*\*

#### PINK SALMON OFF SOUTHEAST ALASKA COAST:

High-seas fishing and tagging by Canadian and United States vessels indicated that a large concentration of pink salmon were lying off the coast of southeastern Alaska on June 10. Whether those fish were bound for southeastern Alaska or points farther south was not known at the time.

\*\*\*\*\*

#### BUTTER CLAM DIGGING FEASIBLE DESPITE EARTHQUAKE:

A 2-week survey of the effect of the March 27 earthquake on shellfish resources showed in part that in spite of the beds subsiding 4 feet and a substantial reduction of exposed clam beach, commercial digging for butter clams was still feasible in Kasitsna Bay. Indications were that there was little harmful effects generally upon king crab, Dungeness crab, or shrimp. Although some crab pots for both species were lost because of siltation, razor clam beds on the Kenai Peninsula and the Alaska Peninsula did not seem to be severely damaged. The amount of loss of razor clam beaches on the Copper River flats caused by a 6-foot rise in land elevation had not yet been accurately determined, but it was not expected to be of major proportions.

\*\*\*\*\*

#### DUNGENESS CRAB REPORTED PLENTIFUL OFF CAPE FAIRWEATHER:

A fishery firm in Douglas sent 5 vessels to the Cape Fairweather area during June. Heavy catches of large Dungeness crab were taken throughout the month. It was reported

that by the end of the month, 200,000 pounds of "prime" crab had been produced from that area. One vessel reportedly landed over 50,000 pounds.



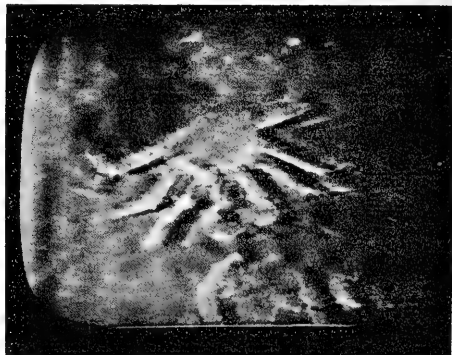
### **Alaska Exploratory Fishery Program**

#### UNDERWATER TELEVISION USED FOR LOCATING KING CRAB:

M/V "Paragon" Cruise 64-1 (May 25-June 15, 1964): Underwater television (UTV) equipment was tested as a method for locating concentrations of king crab off Kodiak Island, Alaska, during this cruise by the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Paragon. Specialized equipment included a compact (18-inch by 3-inch diameter) UTV camera and 1,000-watt mercury vapor light mounted within a protective frame, 500-feet of cable, and a 17-inch monitor from which 16 millimeter movies and still photos were taken.

To make observations, the UTV camera, light, and cable were suspended from a trawl wire and the vessel was allowed to drift. The apparatus was lowered to within 3 to 6 feet of the bottom at most stations. When visibility through the water was good, the camera could be raised to obtain an increased field of view. At 6 feet, an area about 3 feet by 4 feet was included in the field of view.

The length of time spent at each station was determined by weather conditions, configuration of the bottom, water clarity, and



Adult king crab as viewed on shipboard television monitor during M/V Paragon Cruise 64-1 (May 25-June 15, 1964).

number of crabs seen. At some locations, up to 3 hours were spent viewing the bottom. Although the speed of drift varied because of tide and wind conditions, distances up to one mile were surveyed between the starting and ending points of individual stations.

A variety of stations were observed with bottom types ranging from mud to large boulders in depths from 4 to 60 fathoms. During investigations at 44 individual locations adjacent to Afognak, Raspberry, and Kodiak Islands, significant quantities of king crab were observed at only 2 stations. On June 4, in Raspberry Straits, numerous king crab were observed at depths of 8 to 10 fathoms. An estimated concentration of 50 adult crabs was seen on the screen at one time. Off Uganik Cape, Kodiak Island, a concentration of adult king crab was observed in 18 fathoms. One group of at least 50 closely-packed individuals was seen as were lesser aggregations. An estimated total of 200 king crab was seen at that station.

At least one crab was seen at most of the other stations and as many as 30 to 40 scattered crabs were viewed at a station in the Alitak Bay area.

Dungeness crab, shrimp, cod, flatfish and other marine life were observed frequently during the experiments. Plankton and suspended matter in the water limited the effective field of view. Conditions during other seasons with plankton less abundant would enhance the potential of underwater television in prospecting for crabs. Bottom resources of wide areas of the continental shelf off Alaska are only poorly known. The demonstrated ability of UTV for locating king crab, shrimp, and other marine life indicates its possible application in future exploratory surveys.



## Alaska Fisheries Exploration and Gear Research

### SHELLFISH EXPLORATIONS STARTED BY RESEARCH VESSEL "PARAGON":

On June 16, the U.S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Paragon started shellfish explorations from Kodiak westward. As a warm-up, one haul of 1,200 pounds of 16-21 count

(heads-on) sidestripe shrimp was taken in Marmot Bay, off Kodiak. In addition, a nearby drag with an 8-foot scallop dredge yielded 4 bushels of up to 7½-inch scallops.

\* \* \* \* \*

### KING CRAB TAGGING:

The king crab fishery began to operate in June in the Kodiak area after a 2-month period of inactivity. The first research charter cruise of the season by the Bureau of Commercial Fisheries started in late May and continued until June 15. Fishing for crab with trawls and conventional crab pots at 11 locations in the Portlock Bank area yielded 3,560 king crab. Over 3,000 of those crabs were tagged and released.



## Botulism Research

### FEDERAL GOVERNMENT COMMITTEE FORMED TO COORDINATE RESEARCH:

A permanent Federal Government committee, called the Interagency Botulism Research Coordinating Committee (IBRCC), was formed recently as a result of a meeting held in February 1964 of officials of various Federal Government agencies in Washington, D. C. Members of IBRCC are from the Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, Public Health Service, Atomic Energy Commission, and the Food and Drug Administration.

The purpose of the committee is to (1) coordinate exchange of information, (2) coordinate to the degree possible interagency research programs, and (3) to serve as consultants in the field on current and projected Government research programs on C. botulinum. Although the scope of interest of the agencies represented are applicable to all food products, priority attention was being given to fishery products. The coordinated reports of this committee will provide an up-to-date review of the botulism research field and its direct application to the fishing industry.



## California

### COMMERCIAL SHRIMP QUOTA OFF CRESCENT CITY-EUREKA AREA INCREASED:

The shrimp quota in Area A, off the coast of the Crescent City-Eureka area, Calif., was raised to one million pounds at a special meeting of the California Fish and Game Commission in Sacramento July 13, 1964. The quota, which affects landings, was raised from the 500,000-pound limit set June 26 in San Francisco, and was in accordance with a survey of the Area A shrimp grounds made by the Department of Fish and Game and representatives of the commercial shrimp industry.

The survey showed there was about 2.2 million pounds of shrimp in the Area A grounds, which is about 50 miles square. Although the 2.2 million pounds is more than was found during the preceding preseason survey, the Department pointed out that it is only half the shrimp population of last year (1963).

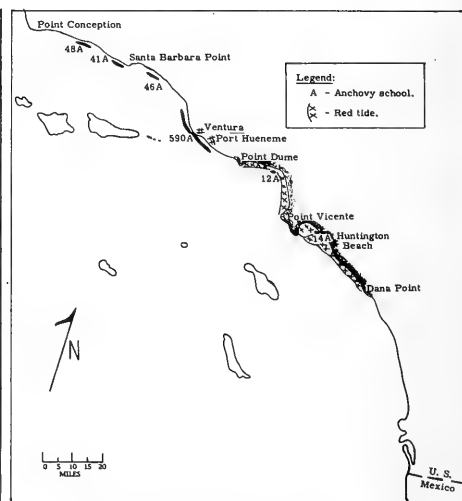
The Commission asked the Department to continue monitoring the shrimp population in Area A and to report the latest findings to the Commission at its August 28, 1964, meeting scheduled in Sacramento. The Commission indicated that should the findings be different from those of the last survey, the quota might be raised or lowered, depending on the evidence presented. (California Department of Fish and Game, July 18, 1964.)

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### PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 64-11-Pelagic Fish (June 15-17, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Conception to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game Cessna "182" N9042T.

On June 15 the area from Point Vicente to Huntington Beach was scouted but visibility was very poor and no fish schools were sighted. The following day, the area from Point Vicente to the United States-Mexican Border was covered. It was observed that "red tide" conditions prevailed along the shoreline from the western Los Angeles-Long Beach harbor area to Dana Point. Only



Pelagic fish survey Flight 64-11, June 15-17, 1964.

10 northern anchovy (*Engraulis mordax*) schools were sighted.

On the last day of the survey the area from Point Conception to Dana Point was scouted. Large concentrations of anchovies (638 small schools) were sighted between Point Dume and Santa Barbara Point, mainly in the Ventura-Port Hueneme area. From Santa Barbara Point to Point Conception 89 small anchovy schools were seen. "Red tides" prevailed between Dana Point and Point Dume. A total of 26 anchovy schools were sighted in that area.

Note: See Commercial Fisheries Review, June 1964 p. 11.



### Cans--Shipments for Fishery Products

January-May 1964: A total of 1,100,953 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-May 1964, a decrease of 8.7 percent from the 1,205,362 base boxes used during the same period in



1963. The decline was due partially to a drop in the canning of jack mackerel and Maine sardines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" in size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



## Central Pacific Fisheries Investigations

### TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 4 (May 14-June 5, 1964): This was the fourth in a series of oceanographic cruises to determine rates of change in the distribution of properties in the trade wind zone of the central

North Pacific. The research vessel Townsend Cromwell, of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, operated in an area of the Central North Pacific Ocean bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W. during this cruise.

A total of 43 oceanographic stations were occupied along the cruise track (chart) during this cruise. At each station temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters.

Bathothermograms (BT) were obtained at 30-mile intervals along the cruise track. Between stations 19 and 21, 26 and 28, 35 and 37, BT casts were made at 10-mile intervals. The BT data were coded and transmitted four times daily to Fleet Numerical Weather Facility, Monterey, Calif. Surface bucket temperatures and water samples for salinity analysis were obtained at each BT observation.

At station 33, subsurface currents were measured at depths of 10, 25, 50 and 75 meters, using an Ekman meter, while drifting relative to a parachute drogue set at 1,200 meters.

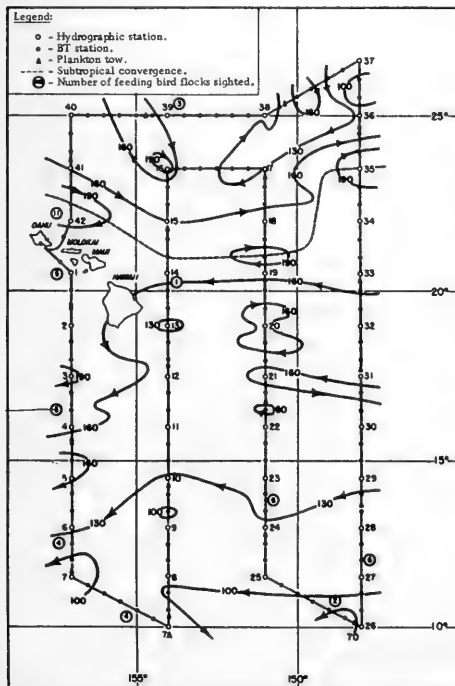
Ten plastic enclosed drift cards were released at 30-mile intervals along the entire cruise track. Drift cards also were released hourly along the track between Kahului and 18°30' N. latitude and between oceanographic station 42 and Honolulu.

Standard marine weather observations were made and transmitted daily at 0000, 0600, 1200 and 1800 GMT.

Colored photographs of cloud formations were taken each day. No solar radiation measurements were taken because the pyrhelio-meter was inoperative. One-half hour surface plankton tows were made using a 1-meter net at 2000 daily. Flyingfish collected from the vessel's deck were preserved in formalin.

A standard watch for bird flocks and fish schools was kept by vessel personnel during daylight hours. In addition, observers aboard the vessel from the Smithsonian Institution kept their own watch for birds.

Preliminary inspection of the vertical temperature profiles during this cruise indicated that, in general, a relaxation of the current flow and a warming of the surface waters had



Cruise track chart of M/V Townsend Cromwell Cruise 4 (May 14-June 5, 1964) showing contours of 20° isotherm depth.

been taking place shortly before the beginning of this cruise. The eddies in the area were less pronounced than in the previous cruises and the general westward flow-pattern was weaker and more regular as deduced from geostrophic interpretations of the  $20^{\circ}$  isotherm depths. The warming effect was seen as a gradual northward creeping of surface isotherm and a shallowing of the mixed layer depth. Surface temperatures ranged from  $27^{\circ}$  C. ( $80.6^{\circ}$  F.) in the southern portion of the cruise area to  $22^{\circ}$  C. ( $71.6^{\circ}$  F.) in the northeastern portion.

A feature which became more pronounced during this cruise was the rapid southward rise in surface temperature of  $0.5^{\circ}$  C. ( $32.9^{\circ}$  F.) or more per 30 miles beginning at  $15^{\circ}$  N. latitude. Corresponding with that temperature rise was the formation of a sharp near-surface thermocline which deepened rapidly and finally merged with the main thermocline. Numerous feeding birds were seen in association with those features.

Note: See Commercial Fisheries Review, August 1964 p. 17.

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#### "ANTON BRUUN" PARTICIPATION IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

With the completion of Cruise 5 of the oceanographic research vessel Anton Bruun in June 1964, the U. S. Bureau of Commercial Fisheries Biological Laboratory in Hawaii completed the field aspects of its participation in the International Indian Ocean Expedition. The Laboratory's program was carried out in conjunction with and as part of the United States Program in Biology as coordinated by the Woods Hole Oceanographic Institution.

The Laboratory was responsible for the planning and execution of four cruises of the Anton Bruun that included studies of the demersal fish and invertebrate resources in the Bay of Bengal from March to May 1963 (Cruise 1), and in the Arabian Sea from November to December 1963 (Cruise 4B); and studies of the pelagic fish resources in the central and western Indian Ocean from May to July 1963 (Cruise 2), and from January to May 1964 (Cruise 5).

In the survey of the demersal fish and invertebrate resources of the Bay of Bengal (Cruise 4B), a total of 86 successful hauls was made with the Gulf of Mexico shrimp



Oceanographic research vessel Anton Bruun, participating in the International Indian Ocean Expedition, in Bombay Harbor, India.

trawl. On Cruise 2, long-line fishing was carried out at 33 stations which were spaced at intervals along longitude  $70^{\circ}$  E. between latitudes  $18^{\circ}$  N. to  $37^{\circ}$  S. and along longitude  $80^{\circ}$  E. from latitudes  $30^{\circ}$  S. to  $02^{\circ}$  N. On Cruise 5, a total of 38 long-line fishing stations was occupied along longitude  $55^{\circ}$  E. from latitudes  $10^{\circ}$  N. to  $36^{\circ}$  S. and along longitude  $75^{\circ}$  E. from latitudes  $43^{\circ}$  S. to  $04^{\circ}$  N. An indication of the excellent performance of the Anton Bruun in fishing was that on several occasions the long-line gear was hauled in successfully in rough seas (12 to 20 feet) and strong winds (30 to 35 knots).

Cruise 5 gives an indication of the diversity of the scientific program carried out on board the vessel. A total of 26 fishermen, technicians, and scientists participated on that cruise. In addition to the Bureau's program and the basic observations scheduled by the Program in Biology, other interests represented among the scientific party included studies on marine birds, medusae, parasitic copepods and helminths, plankton and dinoflagellate physiology, plankton ecology, and meteorology.

A typical work day during the cruise started at 0500 hours when 50 baskets of long-line gear were set. While the gear was "soaking," the following activities were carried out in the vicinity of the drifting fishing gear:

1. A hydrographic cast down to 2,000 meters (6,562 feet); measurements made of the salinity, oxygen, phosphate, and silicates;
2. A vertical plankton net tow from 200 meters (656 feet) to the surface using the standard Indian Ocean net;
3. A vertical 200 meters to the surface micro-plankton net tow for phytoplankton studies.



4. Water samples from various depths for purposes of primary productivity studies and phytoplankton pigment studies;

5. A multiple plankton net tow using the Bé nets which permit sampling simultaneously the zooplankton fauna at various depths ranging from the surface down to 2,000 meters.

6. High-level weather observations made with Radiosonde balloons.

The hauling-in of the long-line gear commenced at about 1300 hours. Depending on the size of the catch, hauling took from 2 to 3 hours. Because of the high freeboard of the Anton Bruun, the large fish were hoisted on board in a 8 x 4-foot rectangular net. Hoisting of the net was done with a hydraulic boom. Each fish when landed was identified and length and weight measurements taken. The external body surfaces were examined for parasitic copepods and parasitic trematodes. When present, those parasites were preserved for later detailed studies.

Other biological material collected included: (1) guts and gills of fish which were preserved for later examination for trematode parasites, (2) preservation of ovaries for maturation studies, (3) preservation of stomach contents of fish for food studies, and (4) collection of blood samples from tuna for subpopulation studies. A number of whole specimens were also preserved for taxonomic studies. After hauling had been completed, the Anton Bruun then commenced on a run to the next station. Generally, an attempt was made to cover 135 to 140 nautical miles. During the course of the run, bathythermograph casts were made at 3-hour intervals to obtain temperature data and at 2000 hours the vessel was slowed down in order to take a surface and an oblique plankton haul.

Note: See Commercial Fisheries Review, April 1963 p. 16.



## Chesapeake Bay

### CHESAPEAKE RESEARCH COUNCIL ORGANIZED:

The Virginia Institute of Marine Science, the Chesapeake Biological Laboratory of the University of Maryland, and the Chesapeake Bay Institute of Johns Hopkins University

have organized the Chesapeake Research Council. In discussing the purpose of the Council, the Director of the Virginia Institute of Marine Science said, "This organization of the three primary research institutions concerned with the estuarine waters of Chesapeake Bay and the ocean waters off the coast of Virginia and Maryland will allow for a coordinated approach to common problems. It provides a framework within which we can effectively cooperate in programs concerning all three agencies."

The Chesapeake Research Council will hold its first full meeting in January 1965. At that time staff members of the three research institutions will summarize their present research programs and consider matters of mutual interest. The Chesapeake Biological Laboratory has been conducting research on Maryland's marine resources since 1927, and the Chesapeake Bay Institute has been engaged in studies of marine waters throughout Maryland and Virginia for the past 16 years. The program of the Virginia Institute of Marine Science was started in 1940.

The three institutions have always worked closely together on common problems in the past. Scientists from the three institutions established the Atlantic Estuarine Research Society in 1949 for the express purpose of exchanging ideas and reporting their research programs. That organization, however, has become so large, embracing members from Maine to Florida, that it seemed wise to create another smaller organization for specific work around Chesapeake Bay. Because of the unified nature of the Chesapeake Bay and the Virginian sea portion of the Atlantic, and because many of the problems in the area are of a long-term nature, scientists have sound reasons for approaching their investigations in a cooperative manner. (Virginia Institute of Marine Science, Gloucester Point, July 21, 1964.)



## Clams

### RESEARCH BY UNIVERSITY OF RHODE ISLAND:

Nine bushels of the world's most expensive quahogs (clams), valued at about \$1,750, have been placed at the bottom of Narragansett Bay, R. I., with a University of Rhode Island "brand" on them. In the middle of each of the

3,500 quahogs is a red plastic disk with the notation on the perimeter: "Narragansett Marine Lab., Kingston, R.I." The center of the half-inch disk carries the word "Reward" and an identifying number. If returned to the University of Rhode Island with the half of the shell to which they are attached, the disks will be worth 50 cents each.

Thus, the total value of the quahogs is based on the return of each of the 3,500 specimens with a 50-cent reward for each individual return.

The recovered quahogs will help in developing some definite information about harvesting and growth rates of shellfish under varying underwater conditions around Narragansett Bay. An Associate Professor of Oceanography at the University urges the public to return the shell-half with the tag on it, but not to send the entire quahog through the mail. (Source: University of Rhode Island--reprinted from National Oceanographic Data Center Newsletter, May 31, 1964.)



## Federal Aid

### PACIFIC NORTHWEST STATES RECEIVE FUNDS FOR FISHERIES PROGRAM:

Pacific Northwest States will receive \$1,915,000 in Federal aid funds for construction, operation, and maintenance of fishery facilities, stream improvement, and operational studies in 1964/65 fiscal year under the Columbia River Fishery Development Program, the U. S. Bureau of Commercial Fisheries announced July 17, 1964. The States of Washington, Oregon, and Idaho will share the Federal money as part of the program aimed at improving anadromous fish runs of the Columbia River and its tributaries, said the Bureau's Regional Director at Seattle, Wash.

The major portion of the total is an allocation of \$989,000 for operation and maintenance of 8 salmon and steelhead hatcheries in Washington and 7 in Oregon which were either built or remodeled with Federal funds but are operated by the states. This allotment includes \$412,000 for 6 salmon hatcheries operated by the Washington Department of Fisheries; \$145,000 for 2 steelhead hatcheries operated by the Washington Department of

Game; \$380,000 for 6 salmon hatcheries operated by the Oregon Fish Commission; and \$52,000 for the Oregon Game Commission's Gnat Creek steelhead hatchery near Astoria.

Those three States also will receive \$48,000 for stream improvement and \$98,000 for fish screen maintenance, plus \$181,000 for their work in cooperation with "Operation Fin Clip," the Bureau's massive appraisal program which is being conducted over a 10-year period to evaluate the contribution of the hatcheries to the fish runs.

A total of \$198,000 is allocated for construction, of which \$75,000 will be contracted to Idaho for 26 fish screens on the Salmon River and its tributaries; \$67,000 to Oregon for a new pipeline and rearing pond at Big Creek hatchery near Astoria; and \$28,000 each to Oregon and Washington for facilities to remove log jams and debris from various streams.

A sum of \$300,000 is being earmarked by the Bureau for operational studies by the fishery agencies of the three States and their respective universities. Included in that phase of the program are a study on selective breeding of salmon and steelhead by the University of Washington, an investigation by Oregon State University of factors involved in the transition which takes place in young salmon as they move from fresh to salt water, and research by the University of Idaho on development of a toxic material which would eliminate trash fish and predators without harming salmon. The various State fishery agencies are also planning a number of other research projects.



## Fish Kills

### MORE FISH KILLS IN LOUISIANA INVESTIGATED:

A series of new fish kills in Louisiana's sugarcane growing areas are being investigated, announced the U. S. Public Health Service, Department of Health, Education, and Welfare (HEW) on July 10, 1964. The State of Louisiana water-pollution control agency reported fish kills in 5 bayous and canals in Southern Louisiana during a single week this past June and Public Health Service scientists were attempting to determine the cause of those kills.

State officials had previously requested the Public Health Service to give technical assistance in the lower Mississippi to locate, identify, and abate all sources of pesticide pollution. The team investigating the later fish kills was operating under that agreement. The request for technical assistance was made in April 1964 after the Public Health Service and the State of Louisiana announced that toxic synthetic organic materials appeared to have caused the large fish kills in the lower Mississippi River.

A four-State water-pollution enforcement conference called by the Secretary of Health, Education, and Welfare, in New Orleans in May found that the pesticide endrin was the cause of the massive fish kills during the fall and winter of 1963 and that industrial operations at Memphis, Tenn., were sources of endrin discharge into the Mississippi River.

HEW officials pointed out that the water from the bayous and canals involved in the later Louisiana fish kills does not flow into the Mississippi or the Atchafalaya Rivers where the massive fish kills took place last fall and winter.

The bayous and canals involved were: Grand Bayou, Bayou Blach, Theriot Canal, Bayou Chevreuil, and Company Canal. (Public Health Service, U. S. Department of Health, Education, and Welfare, July 10, 1964.)

Note: See Commercial Fisheries Review, January 1964 p. 74.

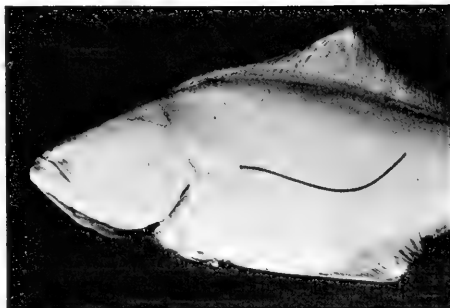


## Flatfish

### NORTH PACIFIC MIGRATIONS OF HALIBUT AND SOLE:

A halibut tagged near Kodiak, Alaska, in July 1951 was recovered over 1,400 miles away off Tillamook Rock in northern Oregon waters in August 1952, according to the Oregon Fish Commission. Another halibut tagged off Unalaska, Alaska, in May 1959 was recovered off the southern Oregon coast in the vicinity of Cape Arago in September 1961, after traveling a minimum distance of 2,000 miles. That distance indicates an average rate of movement of about 75 miles a month.

The 2 halibut are among the more than 100,000 that have been tagged since investigations were begun under the sponsorship of the International Pacific Halibut Commission



A dart tag in position on a North Pacific halibut.

in 1925. The movements of halibut and other species have important implications in fisheries management.

Tag recoveries have also indicated extensive migrations by other flatfish. In February 1960, the Oregon Fish Commission released 5,026 tagged petrale sole near Heceta Bank off the central coast of Oregon. Through April 1964, a total of 340 of those fish had been recovered. The fish were recaptured from such widespread spots as southern Vancouver Island (British Columbia), Canada, about 360 miles northward, to Trinidad Head, Calif., approximately 215 miles south of the tagging area. Slightly over half of the recoveries were within 30 miles of the tagging area, while the remainder were spread along 570 miles of the coastline of northern California, Oregon, Washington, and British Columbia.

English sole are also wanderers, according to the Oregon Fish Commission, traveling about the same distances as petrale sole, but with an apparent tendency to move toward northern waters.

Dover sole apparently have a more limited range than English or petrale sole. In April 1955, for example, some 2,406 Dover sole were tagged and released by the Oregon Fish Commission west of Grays Harbor, Wash. Of the 284 recoveries as of mid-1964, only 10 were picked up at distances greater than 30 miles from the point of tagging. The maximum migrations were by 2 fish captured off Vancouver Island, a distance of from 110-140 miles, and 1 off northern California, a distance of about 360 miles. (Source: Notes on Movements of Tagged Sole and Halibut, Oregon Fish Commission.)



## Fur Seals

### PROCESSING CONTRACT NEGOTIATIONS BY U.S. DEPARTMENT OF THE INTERIOR:

The U.S. Department of the Interior announced July 17, 1964, the start of negotiations late in July 1964 with firms seeking a contract for processing Alaska sealskins for the United States Government. The three firms invited to participate in negotiations are: Superior Seal, Inc., Chicago, Ill., Pierre Laclede Fur Company, St. Louis, Mo., and Fjouke Fur Company, Greenville, S.C.

Each of the companies has been required to submit with its proposal to the Government, samples of processed furs for use in a three-phase evaluation program: (1) evaluation of the sealskins by a panel of experts from various Federal agencies, (2) physical and chemical tests conducted by the National Bureau of Standards, and (3) a marketability study based on garments manufactured from the sample sealskins.

Each year the U.S. Bureau of Commercial Fisheries harvests some 80,000 fur seals on the Pribilof Islands in Alaska. The surplus animals are taken from a herd of about 1,500,000 animals which is managed under the terms of an international agreement with Canada, Japan, and the U.S.S.R. The agreement provides that Canada and Japan shall each receive 15 percent of the sealskins harvested on the Pribilof Islands.

Following curing of the sealskins on the Pribilofs by the Government, the skins are shipped to a processor who dresses and dyes them under contract. The furs are then sold at semiannual auctions for the account of the United States Government. At the last auction held in April 1964, the 2 types of furs into which Alaska seal are processed brought average prices of \$90.60 and \$48.82 per skin.



## Great Lakes Fisheries

### Exploration and Gear Research

#### SCHEDULE OF FISHERY

#### EXPLORATIONS IN LAKE SUPERIOR:

The Lake Superior fisheries exploration and gear research program of the U.S. Bureau of Commercial Fisheries for Fiscal Year 1965 will include basic seasonal fishing

surveys timed to significant production periods. This is one phase of the "Technical Assistance Project for Providing Assistance and Other Services to the Commercial Fisheries Sector of the Lake Superior Economy." This is an Area Redevelopment Administration Project and that agency provided funds to the U.S. Bureau of Commercial Fisheries for an 18-month study involving technology, economics, marketing, and exploratory fishing.



U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho.

Lake Superior operations of the Bureau's exploratory fishing vessel Kaho, based at Saugatuck, Mich., will be confined for the most part east of Keweenaw Peninsula in Lake Superior and will consist of surveys to be made during three critical production periods in the Lake Superior commercial fishery. The surveys will be confined to a limited area so as to assure thorough enough coverage to permit an accurate evaluation of methods used.

Cruise 18 by the Kaho (May 25-June 10, 1964) was made during the time of year when the inshore smelt-spawning-run fishery had just about finished and prices for chubs and lake herring (cisco) were declining while chub production in the lower lakes increased. The objectives of that cruise were:

1. Assessing area bottom conditions for suitability to otter (bottom) trawling.
2. Determining vertical and horizontal distribution of fish concentrations as shown on depth sounder recordings.

3. Determining practicability of using otter trawls for economical production of smelt, chubs, and lake herring during that period.

4. Testing midwater trawl for capturing midwater concentrations of fish if located.

M/V Kaho cruise scheduled for August 4-24, 1964: At this time of year smelt reportedly interfere with gill-net fisheries at 15-fathom depths off the east shore of Keweenaw Peninsula which may indicate smelt are available to otter trawls in significant quantities. Objectives of this cruise will include:

1. Determining midsummer availability of smelt, chubs, and lake herring to trawls.

2. Following through on leads in areas west of Keweenaw Peninsula if time is available.

M/V Kaho cruise scheduled for November 6-25, 1964: At this time of year heavy production of lake herring with traditional gear is experienced. However, glut conditions soon develop and human food markets are quickly swamped. Although animal food markets will accept lake herring, traditional fishing gear cannot produce them profitably because of the limited landed value of animal food fish. Objectives of this fishing survey will include:

1. Attempting to improve quality of lake herring produced during spawning season by catching with trawls or seines and utilizing improved holding systems--in cooperation with technological assistance.

2. Determining the practicability of utilizing otter trawls, midwater trawls, or lampara seines for economical production of lake herring for animal food markets.

Cruise reports on these surveys by the Bureau's exploratory fishing vessel Kaho will be published on completion of each.

Note: See Commercial Fisheries Review, August 1964 p. 23.

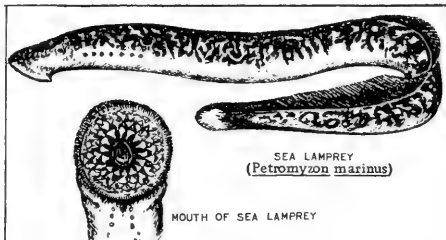


## Great Lakes Fishery Investigations

### SEA LAMPREY CONTROL AS OF JUNE 1964:

The sea lamprey 1964 catch at Great Lakes assessment barriers continued at a somewhat higher level than in the previous 2 years. The

take of spawning-run lampreys was 10,664 by June 26, 1964, compared to 9,948 in 1963 and 8,276 in 1962. The Brule River, Douglas County, Wis., contributed 58 percent of the total sea lampreys this season compared to 32 percent last year. The index barriers operated on 3 Green Bay streams have captured a total of 4,569 compared to 7,425 a year earlier. The index barrier in Pere Marquette River was shut down on June 14. The total number of sea lampreys was 678 for the season. The Ocqueoc River barrier on Lake Huron captured 2,671 lampreys compared to 4,673 in 1963.



The successful treatment of the Big Manistee River, Manistee County, Mich., added the largest river yet to the growing list of streams to be treated in the United States. The stream discharge was 1,844 cubic feet per second (c. f. s.) and it required 31,392 pounds of lampricide (TFM) to complete the treatment. During the latter part of June the Ford River system, which drains into Green Bay, was treated. Sea lamprey ammocetes were distributed 90 miles upstream. However, flows in the main stream and tributaries were sufficiently satisfactory to complete the treatment successfully. Chemical treatment of Cedar River, Menominee County, Mich., had to be stopped after 4 days of treating in the headwaters when low-water discharge and high storage capacity of the main river pools prevented maintenance of lethal concentrations of TFM between access points to the river. It will be necessary to treat the main river between 100 and 200 c. f. s. of stream flow.

Note: See Commercial Fisheries Review, February 1964 p. 62; October 1963 p. 23; July 1963 p. 38.



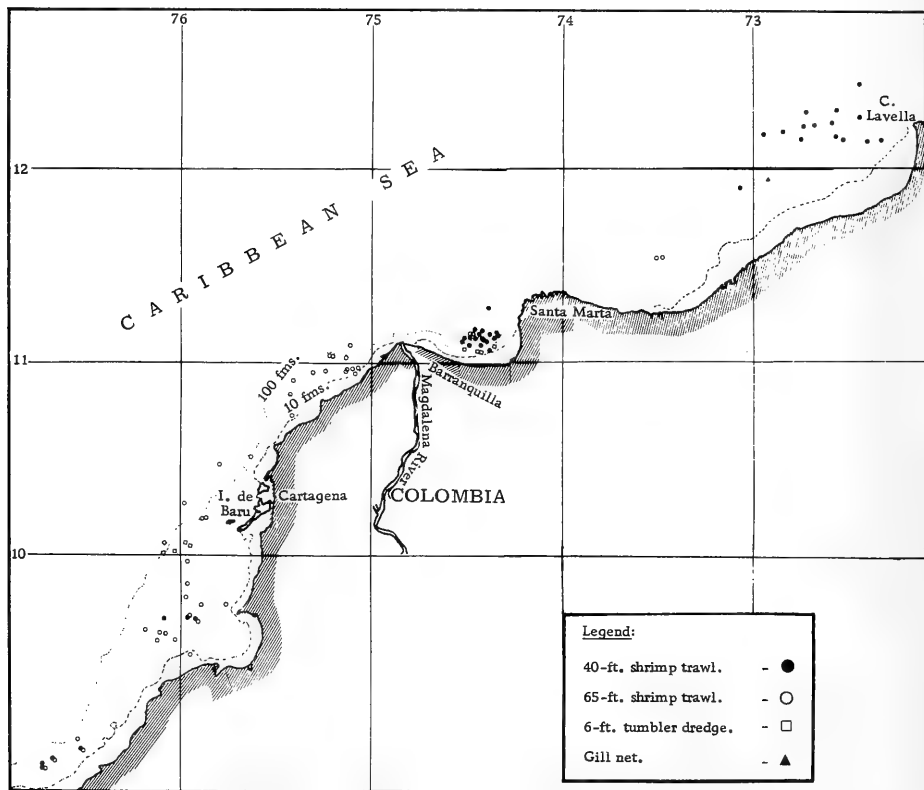
## Gulf Exploratory Fishery Program

### TRAWLING SURVEY OFF THE CARIBBEAN COAST OF COLOMBIA:

M/V "Oregon" Cruise 92 (May 4-June 17, 1964): An exploratory trawling survey off the Caribbean coast of Colombia was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. This cruise completes the Bureau's preliminary survey of the outer Continental Shelf and Slope zones of the Central Western Atlantic mainland between Cape Hatteras, N. C., and Fortaleza, Brazil--a linear distance of some 7,200 miles. During this cruise shrimp trawling and dredging transects were made in all major trawlable areas between depths of 10 and 500 fathoms.

The survey gear used was 40- and 65-foot flat shrimp trawls fished on 6- and 8-foot trawl doors, and 5- and 6-foot tumbler dredges. Trolling lines were out during all daytime running, and monofilament gill-net sets were made on surface indications of Spanish mackerel and tuna.

Shrimp and other Crustaceans: Potential fishing grounds for brown-grooved shrimp (*Penaeus aztecus*) were located in the area between Pta. San Bernardo and the Gulf of Darien. An estimated 700 square miles of good trawling bottom was found in depths of 10 to 40 fathoms and nighttime dragging yielded varying catches of that species on all drags. Working time in that area was limited, but two nights of double-rig trawling using a 40-



Areas investigated during Cruise 92 of the M/V Oregon (May 4-June 17, 1964).

foot and 65-foot trawl simultaneously produced about 540 pounds of heads-on brown shrimp with a few scattered Brazilian shrimp (*P. braziliensis*) mixed in the shallower catches. The 65-foot trawl yielded 350 pounds compared with 190 pounds for the 40-foot trawl. The shrimp were of mixed sizes, ranging from a heads-off count of 20 to 60 per pound, and they averaged 36-40 count.

Royal-red shrimp (*Hymenopenaeus robustus*) were found in light concentrations between 220 and 240 fathoms south of Santa Marta. A single catch of 50 pounds of royal-red off Cape la Vela indicated a potential fishing ground in that area, but extremely adverse sea conditions precluded further deep-water work in the region. The shrimp size was unusually large with the heads-off count averaging about 22 shrimp to the pound.

Catches of lobsterette (*Nephrops binghami*) during the cruise of about 15 pounds per hour with the 40-foot trawl were made in the 170-190 fathom depth range.

**Snapper:** Unusually large numbers of several species of snapper were taken in the shrimp trawling operation in depths less than 60 fathoms. Several commercially valuable species were observed—principally *Lutjanus blackfordi* and *L. vivanus*. Those observations indicated good fish trawling possibilities for snappers but no fish trawls were used on this cruise.

**Tuna and Mackerel:** Heavy seas and strong winds were encountered during most of the cruise and sea surface conditions were poorly suited to surface sightings. During the work off Colombia, only one day of ideal weather conditions was encountered. During the work in the area between Cape Aguja and Cape la Vela, numerous schools of very small blackfin tuna (estimated  $\frac{1}{2}$ - to 2-pound size) were observed. A one-hour set with a 1,500-foot (by 60-foot deep) 6-inch mesh monofilament gill net yielded nothing. All of the fish observed were obviously too small for that mesh size. A single 4-pound blackfin was taken trolling. Several broadbill swordfish and blue marlin sightings were made in the same area.

En route to Pascagoula, one day each was spent tuna scouting in the St. Andrews Island and Yucatan Channel areas. A few small schools were observed around St. Andrews, but the trolling catch was limited to a single

wahoo. No schools were observed in the Yucatan Channel, but 30 blackfin (3 to 18 pounds each), 10 little tuna (*Euthynnus alletteratus*), and 20 runners (*Elagatis bipinnulatus*) were caught on trolling lines over a few hours at the south end of Arrowsmith Bank.

On this cruise, an apparently uncharted flat-topped sea mount was discovered about 30 miles east of Cozumel Island. The top leveled smoothly at 150 fathoms covering an area of more than 20 square miles. Extensive sounding transects were made of the area.

In cooperation with the National Geographic Society, a series of 500 on-bottom 35 millimeter color photographs were taken on this cruise along the 100-fathom curve in the northern Gulf of Mexico.

Note: See Commercial Fisheries Review, June 1963 p. 25.

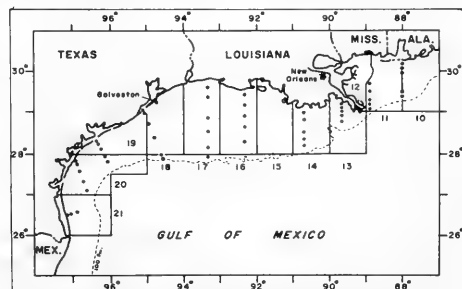


## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-18 (June 17-28, 1964): Catches of brown shrimp were predominant during this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas from off the Louisiana coast extending westward to Texas were covered, and standard 3-hour tows were made with a 45-foot shrimp trawl.

The best catches of large brown shrimp counting 12-15 to the pound were from the over 20-fathom depth of area 16 (46 pounds) and area 18 (14 pounds). Area 18 also yielded



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-18.

18 pounds of 15-20 white shrimp from the under 10-fathom depth, and 68 pounds of small (over 68 count) brown shrimp from 10-20 fathoms.

Area 19 yielded 83 pounds of brown shrimp (51-67 count) from 10-20 fathoms, and from the under 10-fathom range the yield was 16 pounds of 15-20 white shrimp and a small quantity of very small brown shrimp.

A total of 56 pounds of small brown shrimp (51-67 count) was taken from area 20, most of it from 10-20 fathoms, and a smaller quantity of the same size from over 20 fathoms.

During this cruise, 34 tows with a 45-foot flat trawl were made, 50 plankton tows, 45 bathythermograph, and 41 nansen casts. One of the shrimp trawl tows was made in 150 fathoms, but no shrimp were caught at that depth.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

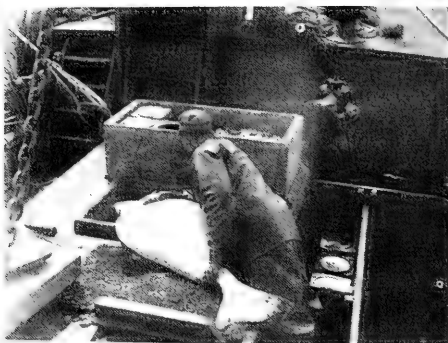
(2) See Commercial Fisheries Review, August 1964 p. 28.



## Halibut

### NORTH PACIFIC HALIBUT LANDINGS, 1964 SEASON TO JULY 20, 1964:

North Pacific halibut landings by United States and Canadian vessels during the 1964 fishing season to July 20, 1964, inclusive, totaled 13.1 million pounds in Area 2 and 22.2 million pounds in Area 3A, the International Pacific Halibut Commission announced July 21, 1964.



Loading a large halibut in the hold of a fishing vessel in the North Pacific. (Metal cans are used to save the livers.)

In Area 2, the halibut fishing season will close at the time of the attainment of the catch limit of 25 million pounds or on September 15, 1964, whichever is earlier. (The rate of landings from Area 2 is expected to be lower during the final months of the 1964 season due to the diversion of part of the halibut fleet to the fisheries for salmon and sablefish.)

In Area 3A, the halibut fishing season will close at the time of attainment of the catch limit of 34 million pounds or on October 15, 1964, whichever is earlier. The closing date of Area 3A will be announced 18 days in advance.

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### QUALITY EVALUATION OF EX-VESSEL PACIFIC LANDINGS CONTINUED:

The second phase of an ex-vessel halibut quality evaluation project was started in Seattle, Wash., and Ketchikan, Alaska, in June 1964 by the U. S. Bureau of Commercial Fisheries. The quality evaluation project during the 1964 North Pacific halibut fishing season is based on the following dual approach: (1) application of a statistical sampling and quality evaluation system for landed halibut; and (2) experimental study of iced and frozen dressed halibut to relate quality changes to the time and temperature factors in commercial preservation practices. At the end of the 1964 fishing season, the results from both quality studies will be analyzed in economic terms with the halibut industry to determine the feasibility of applying a useful grade standard for fresh and frozen dressed halibut.

The current quality evaluation study is a continuation of an investigation begun in 1963. Two of the conclusions drawn as a result of the 1963 halibut studies are: (1) dockside grading is significantly influenced by economic, seasonal, and industry factors that may not be related to actual quality; and (2) the small price differential between dockside grades and the fact that grade 1 is a very broad quality designation does not encourage quality improvement.

Those and other conclusions were discussed informally at meetings of halibut vessel owners, fishermen, buyers, and processors. Buyers and processing firms recognize that the present system does not adequately reflect quality and are interested in a guideline that will eliminate prejudice and improve quality at the grading table.





## Industrial Fishery Products

## U. S. MEAL, OIL, AND SOLUBLES:

Production by Areas, June 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for June 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production <sup>1/</sup> of Fish Meal, Oil, and Solubles by Areas, June 1964 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles	Homogenized <sup>3/</sup> ..... (Short Tons) .....
June 1964:				
East & Gulf Coasts. . . .	38,514	37,588	16,508	-
West Coast <sup>2/</sup> . . .	3,023	2,318	1,486	-
Total. . . .	41,537	39,906	17,994	-
Jan.-June 1964 Total. . . .	81,899	74,574	35,568	-
Jan.-June 1963 Total. . . .	90,156	69,788	36,643	3,841

<sup>1/</sup>Does not include crab meal, shrimp meal, and liver oils.

<sup>2/</sup>Includes American Samoa and Puerto Rico.

<sup>3/</sup>Includes condensed fish.

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## Production by Areas, May 1964:

U. S. Production <sup>1/</sup> of Fish Meal, Oil, and Solubles by Areas, May 1964 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles	Homogenized <sup>3/</sup> ..... (Short Tons) .....
May 1964:				
East & Gulf Coasts. . . .	26,450	28,890	11,088	-
West Coast <sup>2/</sup> . . .	2,077	232	1,487	-
Total. . . .	28,527	29,122	12,575	-
Jan.-May 1964 Total. . . .	41,585	34,123	18,413	-
Jan.-May 1963 Total. . . .	55,656	42,158	23,056	2,500

<sup>1/</sup>Does not include crab meal, shrimp meal, and liver oils.

<sup>2/</sup>Includes American Samoa and Puerto Rico.

<sup>3/</sup>Includes condensed fish.

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## Major Indicators for U. S. Supply, May 1964: United States production of fish meal

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, May 1964					
Item and Period	1/1964	1963	1962	1961	1960
Fish Meal:					
Production:					
May	27,304	39,902	40,504	34,446	19,802
January-Apr. 2/	13,058	16,287	20,161	13,657	16,118
Year 3/	-	253,452	312,259	311,265	290,137

(Table continued on next column.)

Item and Period	1/1964	1963	1962	1961	1960
Imports:					
May	59,543	30,398	25,269	25,116	9,496
January-Apr.	162,371	133,083	89,164	63,393	45,701
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
May	11,736	16,997	16,786	13,629	7,370
January-Apr. 2/	5,838	10,398	9,976	8,799	8,841
Year	-	107,402	124,334	112,241	98,929
Imports:					
May	263	438	265	283	59
January-Apr.	1,539	1,678	3,153	729	2,310
Year	-	6,773	6,308	6,739	3,174
Fish Oils:					
Production:					
May	29,426	33,544	33,436	34,674	16,339
January-Apr. 2/	5,242	7,853	7,262	4,666	4,094
Year	-	185,827	250,075	258,118	209,143
Exports:					
May	9,329	22,150	6,491	3,192	2,427
January-Apr.	46,693	75,401	51,593	43,900	34,764
Year	-	262,342	123,050	122,486	143,659

<sup>1/</sup>Preliminary.

<sup>2/</sup>Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

<sup>3/</sup>Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

<sup>4/</sup>Includes homogenized fish.

in May 1964 was lower by 31.6 percent as compared with May 1963. Production of fish oil and fish solubles was down also by 12.3 percent and 31.0 percent, respectively.

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Major Indicators for U. S. Supply, April 1964: United States production of fish meal in April 1964 was lower by 14.9 percent as compared with April 1963. Production of fish oil was down by 43.3 percent and that of fish solubles decreased 39.5 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, April 1964					
Item and Period	1/1964	1963	1962	1961	1960
Fish Meal:					
Production:					
April	7,094	8,340	9,359	6,112	6,110
January-March 2/	5,964	7,947	10,802	7,545	10,008
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
April	55,953	26,607	26,390	19,060	10,397
January-March	106,418	106,476	62,774	44,333	35,304
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
April	3,045	5,031	4,305	2,965	2,870
January-March 2/	2,793	5,361	5,671	5,834	5,971
Year	-	107,402	124,334	112,241	98,929
Imports:					
April	457	218	323	220	134
January-March	1,082	1,460	2,830	509	2,176
Year	-	6,773	6,308	6,739	3,174
Fish Oils:					
Production:					
April	3,713	6,551	5,645	3,344	2,401
January-March 2/	1,529	1,301	1,617	1,322	1,693
Year	-	185,827	250,075	258,118	209,143

(Table continued on next page.)

Item and Period	1/1964	1963	1962	1961	1960
	..... (1,000 Lbs.) .....				
<b>Exports:</b>					
April	22,773	28,480	10,270	7,351	5,711
January-March	23,920	46,921	41,323	36,549	29,053
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.  
2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.  
3/Small amount (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.  
4/Includes homogenized fish.

\* \* \* \* \*

## FISH OIL PRODUCERS' VIEWS ON MARKET TRENDS:

A technologist of the U.S. Bureau of Commercial Fisheries Technological Laboratory, Seattle, Wash., made a trip through the Midwest and Atlantic Coast Regions this past summer to collect ideas and suggestions on fish oil research, exchange technical information, and to stimulate old and new interest in fish oil. Among his findings was a new trend in the thinking of fish oil producers in those regions. In spite of fish oil selling at a high price--higher than soybean oil--the fish oil producers were not apathetic about future markets for fish oil. They were aware that the existing high prices were due to the European demand and the disappointing catches in the domestic menhaden fishery.

First among the research interests of both fish oil producers and users who were contacted by the Bureau's technologist was the development of an economical commercial method for production of fatty acids from fish oil. A second interest was the development of a commercial method of fractionation of fish oil fatty acids or esters by separating saturates from unsaturates. Some interest was indicated in isolating individual fatty acids.

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## RAW MATERIAL SCARCE IN MAINE:

Fish meal producers in Maine reported the demand for fish meal and oil this summer was excellent, but with an almost total lack of supply due to the scarcity in Maine of fish fillet waste, as well as a scarcity of whole fish. Because of the drop in price of fish solubles, one Maine producer has been adding his entire output back to fish scrap.

\* \* \* \* \*

## FISH OILS:

**U.S. Trends in Supply, Disposition, and Prices, 1946-1964:**  
**SUMMARY:** U.S. total supplies of marine oils have increased from a postwar low of 281 million pounds in 1947 to over 450 million pounds in recent years, mainly due to an upturn in

domestic production. But domestic output dropped sharply in 1963 because of a lower yield from menhaden, the leading source of marine oil produced in the United States.

U.S. marine oil exports have expanded greatly in the postwar era (from 15 million pounds in 1946 to 274 million pounds in 1963). Record U.S. exports in 1963 were attributed to the sharp reduction in world output of marine oils coupled with rising prices. Domestic use, which has fluctuated considerably in the postwar period, fell off sharply in 1963, apparently because of increased prices for menhaden oil.

**DOMESTIC PRODUCTION AND USE:** U.S. marine oil production in the postwar period has ranged from a low of 124 million pounds in 1952 to a high of 266 million pounds in 1961. During the 1950's, production increased rather steadily. However output in 1963 was cutback to only 186 million pounds.

U.S. domestic disappearance during the postwar period has been irregular, ranging from 185 million pounds in 1947 to a low of 83 million in 1954. Domestic use averaged 159 million pounds in 1960-1962, but in 1963 it dropped to 104 million pounds.

Thirty years ago, when sardine oil was more abundant, marine oils were used domestically in shortening manufacture. Use in nonfood products included paints, varnishes, linoleum and other industrial commodities. Today, use in surface coatings has become a major factor. Substantial amounts are used also in lubricant production, in animal feeds, fatty acids, and miscellaneous industrial purposes.

Manufacturers of exterior house paints use heat-bodied marine oils mixed with raw linseed oil. Those marine oils are used also in aluminum paints (exterior and interior), in base and roof paints, rustproof coatings, and undercoat paints. In varnish manufacture, bodied fish oil is used in connection with tung oil. That outlet probably has been gaining in importance, since the varnish industry has been taking advantage of the lower cost of fish oil to replace some of the high-priced tung oil in varnish formulations.

**FOREIGN TRADE:** The United States accounts for around 10 percent of total world production of marine oils and ranks as a major country in world trade in marine oils. Basically, U.S. marine oil trade involves exporting menhaden oil and importing the domestically-scarce marine items (mostly whale sperm oil, which is valuable as a lubricant for fine instruments; because it has few economical substitutes, it is stockpiled by the Government as a strategic commodity for defense purposes).

In 1950, the United States reversed a long-term trend by becoming a net exporter of marine oils for the first time. Since then, exports have grown markedly. During 1950-1954, exports averaged 85 million pounds or about 57 percent of domestic production. In 1963, exports totaled almost 275 million pounds, a record. Europe, the leading market, takes around 90 percent of U.S. exports. The Netherlands, West Germany, Norway, Sweden, and Canada have been the major buyers. However, in 1963, exports to the United Kingdom totaled 87 million pounds, the largest for any single country that year. A large part of the menhaden oil used abroad is for margarine, shortening, and other edible products. In those outlets the oils are refined, hydrogenated, and blended with other fats. Hydrogenation removes certain characteristics of marine oils, such as the odor and taste associated with fish oils.

In 1950-1954, U.S. imports of marine oils averaged 72 million pounds or equal to about one-half of U.S. production. Imports in 1963 were 83 million pounds. Japan, Peru, the Netherlands, Norway, and Canada have been the major U.S. suppliers in recent years.

**PRICE TRENDS:** Fish oil prices (menhaden, crude, tanks, f.o.b., Baltimore) have declined sharply since the end of World War II, from an average of 18.6 cents per pound in 1947 to 4.6 cents in 1962. At the lower level, they were one of the lowest-priced oils on the world market. The relatively low price of fish oil in 1962 gave it a comparative advantage

Table 1 - U. S. Supply and Disposition of Marine Oils, 1946-1963

Year	Supply				Disposition		
	Stocks Jan. 1	Menhaden	Total production/1	Imports 2/	Total Exports & shipments/3	Domestic disappearance	
(Million Pounds)							
4/1963	5/182	168	186	83	451	274	5/104
1962	133	233	250	85	468	130	156
1961	84	243	266	77	427	126	169
1960	114	189	215	56	385	147	153
1959	126	160	195	50	371	147	109
1958	78	132	172	83	333	96	112
1957	103	122	165	60	328	120	129
1956	105	174	207	70	382	144	135
1955	64	154	191	90	345	143	96
1954	74	144	166	53	293	142	83
1953	94	138	155	69	317	108	135
1952	6/98	100	124	81	304	46	165
1951	7/90	97	140	84	314	51	166
1950	109	79	166	74	350	77	182
1949	134	64	136	46	316	40	167
1948	75	68	131	81	286	20	132
1947	118	128	35	281	21	185	
1946	119	76	153	31	303	15	170

1/Includes menhaden, tuna and mackerel, herring, fish liver, whale, and seal oils.

2/Includes fish livers, vitamins, and drugs derived from marine animals.

3/Includes re-exports, fish livers, vitamins, and drugs. In 1947 and 1948, includes some exports under voluntary relief programs.

4/Preliminary data.

5/Factor consumption used for years in which factory consumption exceeds computed domestic disappearance.

6/Includes Government stockpile.

7/Apparent stocks.

Table 2 - U. S. Domestic Utilization of Marine Oils, 1946-1963

Year	Use in Nonfood Products				Total Domestic Utilization			
	Use in shortening	Paint & varnish	Linoleum & oilcloths	Other (lubricating oils, drying & similar oils)	Animal feeds	Fatty acids	Other	
(Million Pounds)								
1/1963	-	16	-	8	27	23	12	3/104
1962	-	68	-	2	25	36	19	7 156
1961	-	62	2	10	38	27	13	17 168
1960	-	33	-	15	37	25	2	41 153
1959	-	3	8	10	25	22	14	27 109
1958	-	11	-	18	-	-	-	82 112
1957	2/11	-	-	21	-	-	-	97 129
1956	11	-	-	18	-	-	-	103 135
1955	13	-	-	21	-	-	-	82 96
1954	20	20	3/	2	-	-	-	80 83
1953	31	31	1	2	-	-	-	102 135
1952	32	32	1	3	-	-	-	129 165
1951	22	22	2	5	-	-	-	125 166
1950	8	21	8	8	-	-	-	140 182
1949	10	15	4	7	-	-	-	131 167
1948	35	27	5	8	-	-	-	97 122
1947	43	34	5	8	-	-	-	85 185
1946	40	28	5	7	-	-	-	81 170

1/More than 500,000 pounds.

2/Factory consumption used for years in which factory consumption exceeds domestic disappearance.

over that of competing drying oils such as soybean, linseed, and tung oils.

U. S. production of menhaden oil dropped sharply in 1963 and monthly prices have been moving up rapidly (from 4.0 cents per pound in January 1963 to 8.5 cents in April 1964). World output of marine oils declined sharply in 1963, due primarily to the reduced Antarctic whale catch, and was at the lowest level since 1960. Production probably will be higher in 1964 than in 1963 and, if so, prices should recede somewhat.

Table 3 - Wholesale Prices of Menhaden Fish Oil Compared with Prices of Linseed, Soybean, Dehydrated Castor, Tung, and Cottonseed Oils, 1961-1964 and Averages for 1956-60, 1951-55, and 1947-50

Year	Menhaden oil, crude, f.o.b. Baltimore	Linseed oil, raw, tank carlots, Minneapolis	Soybean oil, crude, f.o.b. Decatur	Dehydrated castor oil, tank, New York	Tung oil, domestic tank, f.o.b. south ern mills	Cottonseed oil, liquid, tanks, New York
	(Cents Per Pound)					
1964:						
Jan.	8.1	13.3	8.1	25.1	29.1	32.0
Feb.	8.3	13.3	8.0	25.1	27.9	28.8
Mar.	8.4	13.3	8.1	25.1	26.5	19.0
Apr.	8.5	13.3	7.9	25.1	25.7	18.7
1962	4.6	14.2	9.0	25.1	36.9	28.4
1961	6.2	14.2	11.5	25.0	27.6	14.1
Average:						
1956-60	7.9	13.5	10.7	25.9	22.4	16.8
1951-55	8.8	15.5	13.0	28.5	30.3	20.9
1947-50	13.2	25.2	12.6	26.2	23.8	22.6

OUTLOOK: The U. S. domestic marine oil industry (basically menhaden fish oil) still possesses considerable growth potential. Much depends upon research, both in maintaining a continued high menhaden catch and in better utilization of the oil and its derivatives. Utilization research efforts at present are mainly concerned with long-chain, polyunsaturated fatty acids in such areas as protective coatings, textile chemicals, lubricating oil additives, alkyl resins, plasticizers emulsifiers, aldehydes, and fatty alcohols.

Demand for fish meal probably will outweigh demand for fish oil as a consideration for a profitable fishing operation, although a favorable export market for the oil should exist. Domestic use of fish oil depends greatly upon maintaining a price advantage over that of competing vegetable oils. Finally, "new products" research offers possibilities in such fields as human food products, animal feeds, and other industrial uses. To a large degree, research in increased product utilization may hold the key to the future course of the industry. (Fats and Oils Situation, U. S. Department of Agriculture, May 1964.)



## Maine Sardines

### CANNED STOCKS, JUNE 1, 1964:

Canners' stocks of Maine sardines on June 1, 1964, were 37,000 cases less than those on hand June 1, 1963, but were 449,000 cases above stocks on hand two years ago on June 1, 1962 (the pack for the 1961 season was exceptionally small). On the other hand, distributors' stocks this June 1 were 39,000 cases more than on the same date in 1963.

On April 15, 1964, carryover stocks at the canners' level amounted to about 622,000 cases as compared with a carryover of 660,000 cases on April 15, 1963, and a carryover of only 33,000 cases on April 15, 1962, which was a short-pack year.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, June 1, 1964, with Comparisons 1/

Type	Unit	1963/64 Season					1962/63 Season					1961/62 Season				
		6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62	7/1/62	6/1/62	4/1/62	1/1/62	11/1/62	7/1/62
Distributors	1,000 actual cases	254	291	261	308	217	215	264	271	230	134	99	148	193		
Canners	1,000 std. cases/2/	499	658	1,063	1,255	643	536	699	1,092	1,348	374	50	45	144		

1/ Table represents marketing season from November 1-October 31.

2/ 100 3/4-oz. cans equal one standard case.

Source: U. S. Bureau of the Census, Canned Food Report, June 1, 1964.

This year's Maine sardine packing season opened on April 15, 1964. Cannermen were getting ready to start operations as soon as sardines were sighted and landed. Only several hundred cases were reported packed as of early June. By July 11, a total of 211,000 cases (100 No.  $\frac{1}{4}$  cans) had been packed, according to the Maine Sardine Council. The pack was much smaller than in the same period in 1963, when 445,000 standard cases were packed. Ample carryover stocks from the 1963 season caused a later start of intense fishing for the 1964 season. As of mid-July, fishing continued spotty with the heaviest sardine catches in the Rockland-Portland area.

\* \* \* \* \*

#### MAINE CANNED SARDINES SERVED AT NATIONAL BOY SCOUT JAMBOREE:

Maine sardines were again served to 50,000 Boy Scouts at their National Jamboree held at Valley Forge, Pa., during the week of July 20, 1964. It was the third consecutive time that they have been featured on the menu of this event which takes place every 4 years.

The cost of the sardines was shared by the Scout organization and the Maine Sardine Council. The Council furnished a specially designed can cover for the occasion.

The Council's Executive Secretary said, "We consider this an outstanding opportunity to sample Maine sardines to one of the largest gatherings of youngsters in the world and are gratified that the National organization again selected our product from the thousands of items available."

The sardines were used as a quick lunch item on both the day of arrival and departure for the campers. (Maine Sardine Council, Augusta, Me., July 15, 1964.)



#### Marlin

#### BILLFISH RESEARCH CRUISE BY UNIVERSITY OF MIAMI VESSEL:

To search the tropical Atlantic for the spawning grounds of the blue marlin was the objective of a group of about 10 scientists from the Institute of Marine Science, University of Miami, when they left on the Institute's research vessel John Elliott Pills-

bury this past July. The biologists will work in the Gulf Stream and northeast into the Sargasso Sea surrounding Bermuda. Samples of planktonic and other marine life will be taken from the surface down to depths of two miles or more by means of plankton tows, midwater trawls, deep-water trawls, bottom trawls, and bottom dredges. Specimens will also be captured by night-lighting (using a submerged light to attract organisms which are dipped out in nets).

The billfish research, part of a long-range study of the distribution, migration, and growth stages of marlin and sailfish, involves a search for eggs, larvae, and juvenile fishes. Stomach contents of various large fish species are examined and other forms of marine life including squid, octopi, flyingfish, and dolphin will be collected for various other Institute of Marine Science projects. The aims of the cruise include the capture of missing size stages of blue marlin, capture of larval white marlin, and the discovery of centers of spawning activity. Investigators of the Institute's Billfish Research Program have already examined over 600 specimens of young marlin ranging to less than a quarter-inch in length. (Institute of Marine Science, University of Miami, July 19, 1964.)

Note: See Commercial Fisheries Review, August 1964 p. 36; August 1963 p. 43.

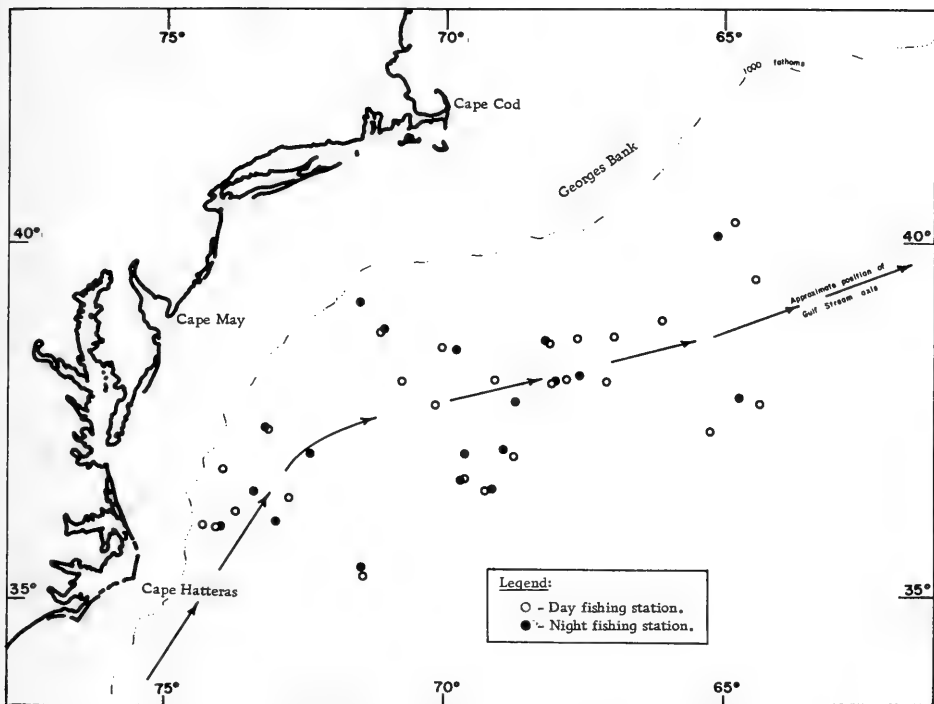


#### North Atlantic Fisheries Exploration and Gear Research

#### TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC:

M/V "Delaware" Cruise 64-3 (April 17-June 4, 1964): The objectives of this cruise were to (1) continue a systematic survey of the seasonal distribution, abundance, and migration of tuna, and (2) investigate the occurrence of both tuna and swordfish in waters contiguous to those in which the annual appearances of those species support commercial fisheries. The exploratory fishing and gear research vessel Delaware of the U. S. Bureau of Commercial Fisheries operated in the western North Atlantic during this seven-week cruise south of New England and east of the Middle Atlantic States.

Night long-line sets were made at 13 stations, and day long-line sets at 26 stations



Area of operations during M/V Delaware Cruise 64-3, April 17-June 4, 1964.

during the cruise. Surface trolling gear was used between stations when weather and sea conditions permitted. Thermal transects using bathythermograph and surface thermograph data were coordinated with hydrographic information from previous investigations to determine positions of fishing stations.

Yellowfin tuna (*Thunnus albacares*) catches, both by the Delaware and commercial swordfish long-line vessels in the area, suggested a commercial abundance of that species along the frontal edges of the Gulf Stream from Cape Hatteras to east of Georges Bank (65° west longitude). A catch rate of 19 fish per 100 hooks 80 miles northeast of Cape Hatteras on May 19, 1964, is believed to be the highest long-line catch rate for that species in the western North Atlantic. Incidental catches by swordfish long-line vessels in the Cape Hatteras area showed similar high rates. Sightings of small groups of

yellowfin tuna "finning out" at the surface were frequently seen and reported, and one 70-pound fish was caught on the vessel's troll gear. The average size of 147 yellowfin tuna examined during the cruise was 74.5 pounds.

Catches of bluefin tuna (*Thunnus thynnus*) were limited to very small numbers of medium and large fish (160-515 pounds). The few albacore (*Thunnus alalunga*) caught were also large (33-58 pounds); one 55-pound fish was caught on troll gear in 71° F. water. In addition, 27 big-eyed tuna (*Thunnus obesus*) (39-200 pounds), and one 14-pound skipjack (*Katsuwonus pelamis*) were caught on long-line gear.

United States and Canadian swordfish long-line fleets were fishing between the edges of the Continental Shelf and the Gulf Stream during much of the time. Swordfish catch rates during night long-line sets, both north and south of the Gulf Stream, were about the same



Swordfish (*Xiphias gladius*)

as commercial fishing vessel catch rates and suggested that swordfish (*Xiphias gladius*) distribution and commercial abundance may extend much farther than waters presently fished. The average size of 15 swordfish examined was 122.2 pounds.

Analysis of thermal data made at sea indicated that surface water intrusions northward from the Gulf Stream formed a convoluted pattern of warm water (60°-65° F.) "fingers" which were seldom over 20 fathoms in depth. Temperatures immediately below those areas dropped to 50°-45° F. Fishing efforts by the Delaware and commercial long-line vessels in the area had greatest success along the edges of those "fingers" where water color, bird activity, surface bait signs, and porpoise schools often gave good indications of increased biological levels.

In cooperation with other agencies, 110 tuna, 4 marlin, and 62 sharks were tagged and released with dart tags. Blood samples of tuna and other species were collected for serological analyses by the subpopulations program at the Bureau's Biological Laboratory in Honolulu. Other data collected and examined included lengths, weights, stomach contents, and sexual condition of all fish taken aboard the vessel. Dip net-night light collections and drift plankton tows were made as time allowed. Other long-line catches of particular scientific note were one specimen of the longbill spearfish (*Tetrapturus pfluegeri*) and one specimen of the gempylid (*Lepidocybium flavobrunneum*).

The Delaware's three-part cruise was broken by port calls at Norfolk, Va., April 29 and May 14, to rebunker the vessel and exchange visiting personnel.

Note: See *Commercial Fisheries Review*, February 1964 p. 37; August 1963 p. 36; June 1963 p. 38.

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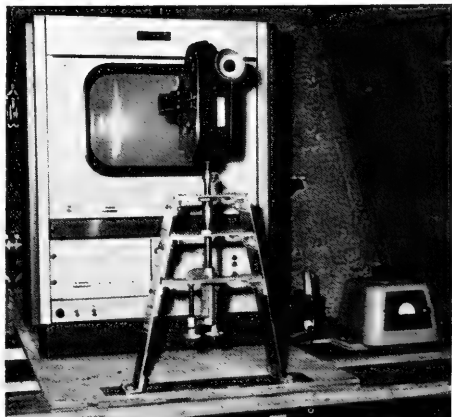
#### ELECTRICAL FISHING GEAR IN OPERATION OBSERVED BY TELEVISION:

M/V "Delaware" Cruise 64-4 (June 18-30, 1964): To observe electrical fishing gear in operation was the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. This was accomplished by means of closed circuit television. The TV camera was lowered along a trolley wire which was attached to the net; the point of attachment for the trolley wire was shifted to change the position of the camera as desired.

Fishing operations during this cruise were conducted in selected areas and at suitable depths for light penetration: (1) in Cape Cod Bay, (2) on the seaward side of Cape Cod, (3) on Stellwagen Bank, and (4) in Ipswich Bay. Difficulty was experienced, during most of the cruise, in getting enough clarity to the picture on the TV monitor screen to permit film recording. All underwater film footage was taken while operating in the Ipswich Bay area.

During the first part of the cruise, the arrangement and number of the electrodes was varied until best results were achieved. It was the first time that the observable results of such changes were possible and the information gained will be put to good use during future modifications to the experimental electrical fishing gear.

A beginning was made on a study film of the electrical fishing method. Most of the fish



TV monitor and camera control unit used on M/V Delaware Cruise 64-4. A 16 mm. movie camera is positioned before monitor screen to make kinescope recordings.

occurring in the depths and areas fished were flat fish. Other commercially-valuable species were either scarce or absent. Successful efforts to film the action of other types of groundfish are hoped for on the next electrical fishing cruise. Adequate film footage of those species will complete the requirements for the study film. The film was taken with a 16 millimeter camera; underwater scenes were taken by filming the TV monitor screen.

Scientific observers aboard the Delaware during this cruise included Doctor Conradin Kreutzer, a well known German specialist on electrical fishing.

Note: See *Commercial Fisheries Review*, January 1964 p. 21.



## North Pacific Exploratory Fishery Program

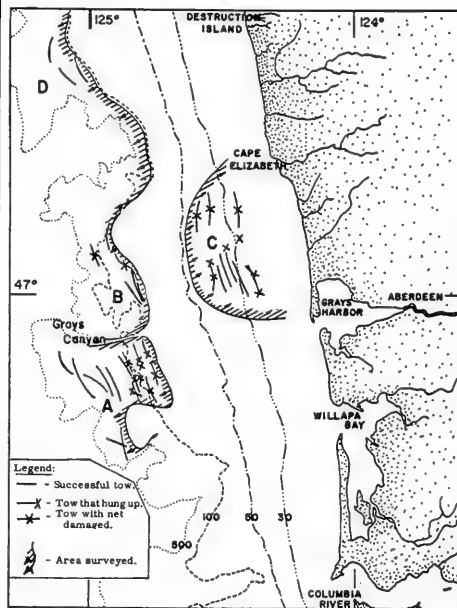
### BOTTOMFISH TRAWLING SURVEY OFF WASHINGTON COAST:

M/V "John N. Cobb" Cruise 65 (April 16-May 28, 1964): The objectives of this six-week bottomfish trawling cruise off the southern coast of Washington State were to: (1) locate trawlable bottom in areas presently avoided by commercial trawlers, and (2) evaluate the commercial potential of groundfish inhabiting any of those new grounds.

The general region surveyed by the U. S. Bureau of Commercial Fisheries exploratory and gear research vessel John N. Cobb during this cruise was along the Washington coast from Destruction Island to Willapa Bay. Within that region there are two areas that are not extensively fished by commercial otter trawlers due to the generally uneven or rocky nature of bottom. One of the areas includes bottom at depths from 100 to 300 fathoms throughout the entire region, and the other is located between Cape Elizabeth and Grays Harbor in 25 to 50 fathoms of water.

Soundings were first made over the areas with recording echo-sounding equipment to determine the feasibility of trawling. When even and soft bottom were found, test drags were made with a snag chain or a net rigged with a snag cable.

Four areas were surveyed on this cruise: (1) south of Grays Canyon from 80 to 380 fathoms, (2) north of Grays Canyon from 80



Shows area of operations during M/V John N. Cobb Cruise 65, April 16-May 28, 1964.

to 200 fathoms, (3) between Cape Elizabeth and Grays Harbor in 25 to 50 fathoms, and (4) west of Destruction Island from 100 to 360 fathoms.

The grounds surveyed south of the Grays Canyon were trawlable in waters deeper than 280 fathoms. Catches were dominated by sablefish which ranged from 364 to 612 pounds of fish per hour of trawling. Between 80 and 280 fathoms, many snags were encountered which resulted in badly torn nets. Two successful one-hour tows were made in 110 fathoms with one of them yielding 3,300 pounds of Pacific ocean perch.

Although the grounds north of Grays Canyon were mostly untrawlable as determined by echo-soundings and exploratory tows, four successful drags were made. The catches from those grounds were small, ranging from 490 to 740 pounds of mixed species (mostly rockfish and flounder) per hour of trawling.

The grounds between Cape Elizabeth and Grays Harbor were found to be flat with scat-

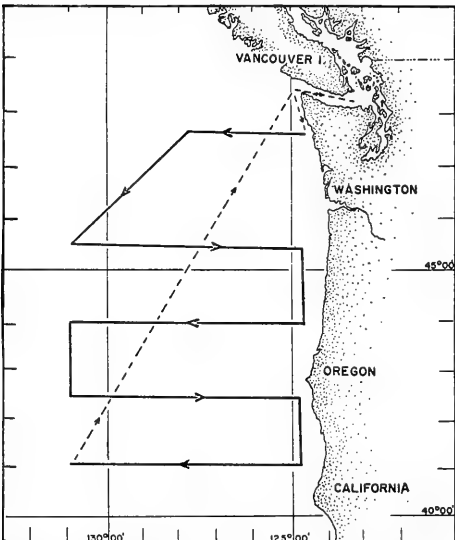
terings of small boulders and outcroppings of shale present which caused damage to nets on most of the exploratory drags. Four successful one-hour tows were made in the southern portion in 25 to 36 fathoms of water. Catches ranged from 530 to 680 pounds of mixed species, predominantly flounder and lingcod.

Three one-hour drags were added during the present survey to the grounds west of Destruction Island where surveys were initiated by the Bureau in 1962. Two of those three drags yielded good catches of sablefish and Dover sole (2,900 and 550 pounds per hour, respectively).

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#### ALBACORE TUNA ABUNDANCE AND DISTRIBUTION STUDY:

M/V "John N. Cobb" Cruise 66 (July 13-31, 1964): To obtain information on the relative abundance and distribution of albacore tuna (*Thunnus germon*) and other pelagic species of fish was to be the primary objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory and gear research vessel John N. Cobb which departed Seattle, Wash., July 13, 1964, for 3 weeks of high-seas investigations off Washington, Oregon,



Shows scheduled trackline during Cruise 66 of the research vessel John N. Cobb, July 1964.

and California. The explorations were to extend from 40°-48° N. latitude in an area about 30 miles off the coast seaward to 131° W. longitude (see chart for trackline). Oceanographic data, including salinity, oxygen, and chlorophyll determinations were also to be obtained during the survey.

Trolling with tuna jigs was to be conducted along the trackline between oceanographic stations. When possible, captured albacore were to be tagged, measured, and released. Albacore unsuitable for tagging were to be prepared for biochemical and microbiological studies. Information on albacore catches were to be broadcast by radio daily to the commercial fishing fleet.

Night-light stations were to be occupied for observations of marine life and forage organisms. In cooperation with personnel from Scripps Institution of Oceanography (La Jolla), standard oceanographic stations were to be occupied daily along the trackline.



#### Nutrition

##### FISHERY PRODUCTS REAFFIRMED AS NUTRITIOUS AND HEALTHFUL:

A statement on fats and oils was issued by the American Heart Association. It reaffirms that Association's stand on the importance of polyunsaturated fats (such as found in fish) in human foods.

The Association's statement declared that reducing the amount of calories in the diet by decreasing the consumption of saturated fat will not only help prevent obesity but will actually lower blood cholesterol as well. This confirms statements such as those of Dr. Lawrence W. Kinsell, Institute for Metabolic Research, regarding "Fish Fats, Blood Fats and Atherosclerosis." He said, "Since men are more prone to early development of the complications associated with atherosclerosis, such as heart disease and strokes, it behooves the good housewife, who wishes to help keep her husband's arteries in good condition, to plan new and intriguing ways of preparing fish and to serve seafoods frequently in the weekly diet."

Many factors influence the development of heart disease, and the American Heart Association has emphasized that people should seek medical guidance in making changes in the fat content of their diet. On the other hand, the Association has pointed out, "evidence from many countries suggest a relationship between the amount and type of fat consumed, the amount of cholesterol in the blood and the reported incidence of coronary artery disease."

As Dr. Fredrick Stare, Chairman of the Department of Nutrition, Harvard University, has emphasized, "Fish as compared with most other high-quality protein foods are generally low in fats, and the fat that is present in fish has a generous proportion of the polyunsaturated fats."

Fish and seafoods have always been considered excellent sources of complete and well-balanced protein and minerals--all of which are necessary to health and a feeling of well-



being. It is becoming increasingly evident that the polyunsaturated fats in the foods from our oceans, rivers, and lakes will lower blood cholesterol, the number one suspect in the type of hardening of the arteries responsible for most heart attacks and strokes.



## Oceanography

### INDIAN OCEAN INVESTIGATIONS BY RESEARCH VESSEL "PIONEER":

The world's steepest continental slope has been discovered off the east coast of Ceylon by the U. S. Coast and Geodetic Survey research vessel *Pioneer*, announced the Department of Commerce on July 12, 1964. The chief scientist aboard the research vessel reported that the slope where Ceylon drops down into the Bay of Bengal is over 45 degrees steep. The average continental slopes vary between 5 degrees off the west coast of Europe, 1 to 15 degrees off the Pacific Coast of the United States, and 4 to 7 degrees off the American east coast.

The *Pioneer* was completing a six-months, 27,000-mile voyage to the Indian Ocean, scientifically one of the world's least known ocean areas. The vessel, described as a completely equipped "floating laboratory," left San Francisco, Calif., on February 11, 1964, to participate in a 20-nation scientific exploration of the Indian Ocean. Scientists from the Philippines, Malaysia, India, Indonesia, and 8 United States scientific agencies were aboard the vessel during the voyage.

The research vessel, which is manned by 104 officers and crew, was scheduled to reach Honolulu, Hawaii, about the end of July on its return trip to the United States and San Francisco-Oakland about mid-August. It will then have completed the longest and farthest trip ever made by a vessel of the Coast and Geodetic Survey in its 157-year history.

In addition to discovering the steep continental slope off Ceylon, other discoveries and activities of the expedition included (1) the finding of several previously unknown undersea mountains; (2) explored for the first time two giant submarine canyons off Ceylon both of which are larger than the Grand Canyon; (3) sent SCUBA divers down to search the top of another undersea mountain; and (4) took thousands of color photos of the bottom of the sea.

The Coast and Geodetic Survey's chief oceanographer, who headed the scientific expedition and flew back to report on its findings, termed the continental slope off Ceylon "truly spectacular." He said, "The west coast of Ceylon is connected with India by a very shallow area. It was known that deep water existed off the east coast, but no one realized how precipitous was the drop from the continental shelf (which begins at the water's edge) to the ocean bottom." He explained that the continental slope is the connecting link between the shelf and the bottom of the sea. He continued, "From about 6 miles off the coast, where we began our soundings, the slope fell from a depth of about 180 feet to about 12,000 feet in the short distance of 18 miles. Nearly 4,000 feet of this vertical drop to the sea bottom off Ceylon was over 45 degrees." "The steep slope is located about 20 miles south of Trincomalee and is about 2 miles long," he said.

The 2 submarine canyons which were explored off the Ceylonese coast were near Batticaloa. The larger, just north of Batticaloa, was 7,800 feet deep and was named Mundeni Canyon for the river closest to it. It was said to be deeper and narrower than the Grand Canyon. The second undersea canyon is located south of Batticaloa and is 2 miles wide at the top and 4,570 feet deep.

According to the oceanographer, one of the most unusual aspects of the trip, was their exploration of an undersea mountain in the South China Sea about 36 to 40 feet below the surface of the ocean. Millions of brightly colored tropical fish swam around them as they made their way over the white coral which covered the top of the mountain. Rock was recovered from the top and sides of the mountain and numerous color photos made of the area with the expedition's underwater cameras.

During the remainder of the expedition, the research vessel *Pioneer* was slated to explore some of the Pacific's most mysterious phenomena, the huge trenches, such as the Java, Philippines, Marianna, Palau, and Yap Trenches, at the ocean bottom. "They are all much larger than the Grand Canyon," explained the vessel's chief oceanographer. "They are large narrow gashes in the bottom of the sea and their origin is still in the realm of theory. We do not know what caused them. There is nothing like them anywhere on land, so we can only study them at sea. Very possibly they represent areas where the earth's crust has

actually been pulled down by forces acting deep within the earth. We hope the expedition will be able to shed some light on the origin of these tremendous sea-floor trenches.

The great wealth of scientific material collected on the expedition, which included a study of the Indian Ocean's physical, chemical, meteorological, geological, biological, and geophysical aspects, will take scientists years to assimilate completely. A preliminary report of the expedition, is to be made available in early 1965. (U.S. Coast and Geodetic Survey, July 12, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 23.

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#### UNIVERSITY OF MIAMI RESEARCH VESSEL RETURNS FROM EQUATORIAL ATLANTIC OCEANOGRAPHIC INVESTIGATIONS:

Extensive oceanograph investigations were conducted by the research vessel John Elliott Pillsbury of the Institute of Marine Science (IMS), University of Miami, during the first part of this year. The 176-foot vessel returned to Miami in June 1964, from five months at sea, after covering 18,600 miles during a series of investigations along the equator and along the west coast of Africa.

With a crew of 19 and a scientific complement of 15, the vessel left Miami on February 1, 1964, and sailed through the Bahamas and south to St. Thomas, Virgin Islands, doing radiation studies. From St. Thomas she crossed the Atlantic to Monrovia, Liberia, arriving there on February 28. For the next 2½ months she participated in EQUALANT III, a 10-nation oceanographic survey of the tropical Atlantic. The vessel's work was concerned with one of the major objectives of the survey--an attempt to track the equatorial undercurrent, a little-known current that flows east along the Equator, beneath the westward-flowing equatorial current. The scientists succeeded in tracking the underwater current for a distance of 1,320 miles to an area where the current dissipated itself along the African coast. The existence of the current, which is located about 150 feet below the surface, has been known to oceanographers for several years, but little or nothing has been known of its course, speed, or point of termination.

At the conclusion of the study of ocean currents in April, the Pillsbury took on a

new group of IMS scientists at Lagos, Nigeria. A study was made of the Gulf of Guinea, a unique ocean region where a combination of currents produces an area of high primary productivity near a fairly sterile region. The chemistry of the water and its plankton were studied--tiny plants, animals, and bacteria. After all data have been analyzed the investigators hope to reach conclusions concerning the reasons for the extraordinary growth of life in certain areas of ocean upwellings.

The next and last phase of the vessel's African cruise was a deep-sea biological expedition. Using bottom trawls of various kinds, midwater trawls, dredges, and grabs in depths of from 90 to 12,000 feet, and using over 6 miles of wire cable, thousands of specimens of deep-ocean and continental-shelf life were collected. Those will be studied to investigate the relationships of the fauna of the eastern and western tropical Atlantic. Many species were taken that are new to science.

Many unusual deep-water fish species were collected, including a black swallower (which can swallow another fish twice its size); the famous fish with the "tricycle landing gear" which was photographed a few years ago from a bathyscape; a barreleye (a fish with eyes in tubes pointed forward like headlights); others known as fang-tooth, snipe-eel, and viperfish. Six rare gulper eel also were caught--more than are found in all the world's museums.

Among the invertebrates collected were a number of species of the rare vampire squid, the poisonous pancake urchin of deep water, numerous cuttlefish, squid and deep-water gelatinous octopods, strange deep-sea crustaceans, brittlestars, sea cucumbers, deep-water tooth shells, and other kinds of animals. The results of the expedition are being prepared and will be a valuable contribution to the knowledge already at hand of tropical and deep-water ocean life.

Commissioned in July 1963, the John Elliott Pillsbury had logged 254 days and 36,000 miles at sea at the end of this equatorial Atlantic trip. About mid-July, she was scheduled to depart on a cruise in the waters between Bermuda and the Bahamas. (News of Institute of Marine Science, Miami, Fla., July 1, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 43.

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### COAST GUARD CUTTER OCCUPIES OCEAN WEATHER STATION:

The long-range program of the U. S. Coast Guard for the full utilization of the oceanographic potential offered by the weather stations moved one step further towards realization when the USCGC Ingham occupied Ocean Station CHARLIE during June 13-July 3, 1964. The Ingham has been outfitted to take routine oceanographic stations, and will be the first of the 327-foot Secretary-Class cutters to undertake a full-scale oceanographic program. She was to be followed at CHARLIE by her sistership the USCGC Spencer in July and August 1964.

Ocean Station CHARLIE is located at 52° 45' N., 35° 30' W., or about 500 miles southeast of Cape Farwell, Greenland, on the summer shipping lanes between Cape Race, Newfoundland, and Bishop's Rock, England. More significantly from an oceanographic point of view, it is located in the transition zone between the warm waters of the North Atlantic Current and the cold outflow from the Arctic region.

As in the case of the first project at Station BRAVO, the first surveys will be largely exploratory, since there is very little historical data available on which to base a sampling plan. The initial program will consist of daily oceanographic casts to 1,500 meters, with a cast to the bottom (about 3,500 meters) about every 10 days.

The data will be processed by the Coast Guard Oceanographic Unit, Washington, D. C., and the results published in the U. S. Coast Guard Oceanographic Data Report Series. The final data will be deposited with the National Oceanographic Data Center, as are the data from all Coast Guard cruises. (U. S. Coast Guard Oceanographic Unit, Washington, D. C., June 15, 1964.)

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### NEW INSTRUMENT EFFECTIVE AID IN OCEAN-BOTTOM STUDIES:

A large bucket-type grab sampler is the principal instrument used in collecting bottom-dwelling animals and related bottom sediments on the Continental Shelf off the North Atlantic seaboard. It is used in that area in a bottom-dwelling fauna study being conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., in cooperation with the Woods Hole

Oceanographic Institution and the U. S. Geological Survey.

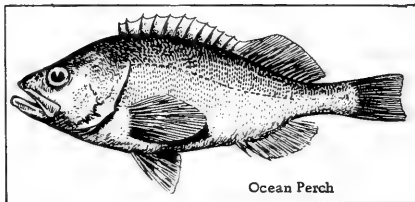
The instrument is made of thick steel plate, measures over 3 feet in its greatest dimension, weighs 550 pounds, and samples a 6-square-foot bottom area. A unique feature of the instrument is a camera and strobe light mounted within the bucket which takes a photograph of the bottom immediately before the device touches bottom. The combination of both photographs and bottom samples for the same spot has aided immeasurably in determining the abundance of animal life on various parts of the Continental Shelf, as well as mapping sediment types, and determining the living habits of various deep-sea creatures.



### Ocean Perch

#### ANNUAL CHECK OF TAGGED OCEAN PERCH OFF MAINE:

A total of 400 fish were taken during the annual checkup in June 1964 of tagged ocean perch off Eastport, Me. The annual check is part of the North Atlantic fisheries investigations program of the U. S. Bureau of Commercial Fisheries on the growth rate of ocean perch. Of the 400 fish taken, 200 had been tagged previously and 16 were tagged in August 1956.



Ocean Perch

Some of the tagged fish taken in this year's check have been recaptured in the same place several times in past years. Out of the 16 fish tagged in August 1956, 15 were recaptured at least twice before, and 1 fish was recaptured 5 times. The average growth of those 16 fish for the 8-year period was barely 1.5 inches.

This project by the Bureau started as an investigation of the growth rate of ocean perch, and has been successful in providing scientific knowledge on ocean perch longevity and

their lack of movement away from even a very restricted locality.



## Oysters

### DEVELOPMENTS ON MSX DISEASE REPORTED BY SCIENTISTS:

Oyster grounds in the Chesapeake Bay area attacked by MSX have not yet recovered, and oysters planted on infected grounds continue to die. This is what the Senior Marine Scientist in charge of oyster research at the Virginia Institute of Marine Science, Gloucester Point, Va., told the members of the Oyster Institute of North America at their annual convention in New Orleans, July 10, 1964.

The scientist said that "For 5 years the protozoan disease (MSX) has been epidemic in saltier waters of lower Chesapeake Bay and our rivers, and it has not yet subsided. We have marked the areas invaded by MSX and the disease has not spread appreciably beyond the fringes of these boundaries during several years." He pointed out that MSX is inhibited by low salinities and disappears each spring from marginal areas due to freshening of the waters by runoff of the spring rains. Although the boundaries of the disease have not been widened, no clear evidence of recovery from the invasion can be detected.

Test plantings of seed oysters by Institute of Marine Science scientists indicate that oysters planted on MSX-infested grounds during the winter or early spring will become infected as the water warms up and will begin to die in late summer and fall with a few deaths occurring throughout the winter. Seed oysters planted in infested areas in late summer become infected immediately but do not begin to die until the following summer. About 40 percent of the oysters planted will die the first summer and 50 to 60 percent will die the second summer. Only about 10 to 20 percent of the original seed oysters planted will remain alive after 2 years. According to the Director of the Institute, Virginia's scientists hope to make use of those survivors in developing resistant strains.

Infections of James River seed oysters have never been extensive, fortunately for the oyster planters. Infections detected in the lower seed beds in the fall disappear by spring as fresh water pushes the salt content lower than the disease organism can tolerate. Plantings of James River oyster seed, even when carrying MSX, have not spread the disease to new areas since those seed were usually planted in rivers and bays where the water contains less salt than the lower James, so the causative organism was killed.

The Institute's scientist in charge of oyster research and his co-workers are busy attempting to develop strains of oysters which will be highly resistant to MSX and other diseases. Oysters which have survived the ravages of MSX for 5 years are being artificially spawned in the Gloucester Point Laboratory and if they show a resistance to the disease, they will eventually be made available to oyster farmers. Testing for resistance to MSX will require a minimum of 3 years even under present accelerated operations. (Virginia Institute of Marine Science, Gloucester Point, July 14, 1964.)

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### BREEDING STOCK RESISTANT TO DISEASE:

Excellent progress is being made in spawning and raising oysters under controlled conditions, announced the Director of the Vir-

ginia Institute of Marine Science, Gloucester Point, Va., on July 20, 1964. He said, "This is an important step in our efforts to produce oysters resistant to disease. As further capabilities are developed, we can look to the day when improved stock, not only of oysters but also of clams, can be produced and manageable mariculture for seafoods will be a reality."

The oyster improvement program at the Virginia Institute of Marine Science is aimed specifically at breeding a special stock of oysters which will survive the protozoan disease MSX. Parents of those oysters are males and females which have survived 5 years in beds where 95 to 98 percent of their fellow oysters succumbed to the disease.

The Senior Marine Scientist in charge of oyster research at Gloucester Point obtained large oysters which have lived most of their lives in disease-infested waters to be the parents of what he hopes will become brood stock highly resistant to MSX. "During late winter we hired a commercial dredge boat and collected live oysters from Mobjack Bay and Egg Island beds which are assumed to have survived the ravages of MSX for 5 years," he related. "Perhaps 95 to 98 percent of the oysters left on those grounds in 1959 have died from MSX infections. We hope these survivors have a natural immunity to the disease and we are testing to see if seed oysters spawned from these survivors will have higher natural resistance to MSX than James River seed," he added.

Laboratory and field work necessary for testing the survival value of these specially selected oysters requires a team effort. One of the Institute's oyster research scientists has devoted many months to studying techniques for caring for larval oysters and has incorporated the principles he has learned into the equipment of a new oyster research laboratory completed in June of this year. Even before completion of the new research laboratory, he began to successfully spawn oysters in early May and by mid-July had collected spat from many spawnings.

Another group of laboratory scientists is responsible for growing the algae (plankton) necessary to feed the young laboratory-reared oysters. A scientist of the Philadelphia College of Pharmacy and Science has been associated with the Institute this past summer in working out problems of the embryonic development of oysters. He is a visiting sci-

entist at the Virginia Institute of Marine Science under the National Science Foundation Research Participation for College Teachers program.

About 20 lots of surviving oysters from MSX and Dermocystidium epidemics have been collected for breeding. Nine lots of laboratory-bred progeny, about the size of a small coin, were available for testing purposes. It will require about 3 years to determine whether or not this progeny is of a quality suitable for commercial purposes. If resistant stocks are obtained, breeding lots of a few bushels will be available to private commercial hatcheries for production. Selection for size, growth rate, and fattness will be made concurrently with resistant studies. Native stocks should be given strong preference in any breeding program, the Institute's oyster research scientists state. (Virginia Institute of Marine Science, July 20, 1964.)



## Pacific Northwest |

### JAPANESE FISHERY OBSERVERS VISIT UNITED STATES:

A Japanese Fishing Industry Goodwill Mission to the United States and Canada arrived in Seattle, Wash., on July 17, 1964, for a six-day tour of Pacific Northwest fishery facilities. The 12 members of the group represent both management and labor organizations in Japan's fishing industry.

The Regional Director, U. S. Bureau of Commercial Fisheries, Seattle, Wash., said the Japanese group was scheduled to visit Columbia River fishery facilities in Washington and Oregon, and commercial fish operations and other installations in the Seattle area. After the United States visit, the Japanese mission was scheduled to go to Vancouver, British Columbia, Canada. Before coming to Seattle, the group had visited several places in Alaska. The group had left Japan on July 1 and arrived in Anchorage, Alaska, on the same day. They were scheduled to return to Japan on July 28.



## Pollution

### PESTICIDE ENDRIN BLAMED IN MISSISSIPPI RIVER FISH KILL:

An official finding that the pesticide endrin was the cause of a massive fish kill in the lower Mississippi River last fall and winter, and that industrial operations at Memphis, Tenn., were sources of the pollution was announced June 26, 1964, by the Secretary of the U. S. Department of Health, Education, and Welfare. The finding took the form of the Secretary's acceptance of the report of a conference held at New Orleans, La., May 5-6, 1964, under the enforcement provisions of the Federal Water Pollution Control Act.

On the two principal points involved--the specific cause of the fish kill and the source of the pollution--the report of the New Orleans conference stated:

"The conferees representing the States of Louisiana and Mississippi and the U. S. Department of Health, Education, and Welfare concluded that the pesticide endrin was responsible for the fish kill in the Mississippi and Atchafalaya Rivers, in Louisiana, during the fall and winter of 1963-64. The conferee representing Arkansas stated that endrin was at least a contributing factor. The conferee representing Tennessee stated that other factors might also be present.

"Industrial wastes and drainage from contaminated areas in and near Memphis, Tenn., are sources of the discharge of endrin into the Mississippi.

"The available data demonstrate that sources, not yet identified, other than those in the Memphis area, may contribute to the endrin found in the lower Mississippi drainage area. These other sources must be identified through further study."

The report stated that minute concentrations of endrin had been found in the treated water supplier of Vicksburg, Miss., and New Orleans, La. "While acute effects on humans of this pesticide in water have not been detected," the report said, "the effects of continued ingestion of even these minute quantities must be evaluated."

In transmitting the report to water pollution control officials of the four States involved, the Secretary of the U. S. Department of Health, Education, and Welfare endorsed

the recommendations of the conference that action be taken to bring known sources of endrin discharges from industry, land drainage, and mud deposits under control "immediately" and that "other sources of endrin pollution be identified and brought under control as soon as possible." The conferees also called for the establishment of a technical committee "to direct and advise in the identification and abatement of all sources of pollution affecting the main stem of the Lower Mississippi" and for a progress report to be prepared within a year. (Public Health Service, U. S. Department of Health, Education, and Welfare, June 26, 1964.)



## Salmon

### NEW FISH BEHAVIORAL FLUME BUILT IN PACIFIC NORTHWEST:

A fish behavioral flume on the Grande Ronde River five miles upstream from Troy, Oreg., was completed and operating successfully at the beginning of this past summer, announced the Regional Director, U. S. Bureau of Commercial Fisheries, Seattle, Wash., on July 1, 1964.

The flume was built by the Bureau as part of its fish-passage research program in an effort to preserve and enhance anadromous fish runs in the Columbia River and its tributaries. The program is being conducted in cooperation with the State fishery agencies of Washington, Oregon, and Idaho. Scientists hope the flume will help them find new ways to collect young salmon and steelhead heading downstream to the ocean so they can be passed around dams and other barriers.

The Grande Ronde flume is the largest of several the Bureau either has built or is building in the Pacific Northwest. Already constructed are flumes at Carson National Fish Hatchery in Washington State, Eagle Creek (near Estacada), Oreg., and on an irrigation diversion of the Umatilla River in Oregon. The Grande Ronde flume cost \$378,000 to build and is a concrete and steel structure placed in the river to test various kinds of experimental fish guiding and collecting devices.

The research biologist and project leader for the research program in Portland said one of the devices likely to be tested in the

flume is a velocity accelerator barriers. It would consist of a series of concrete weirs in the bottom of the flume which would cause the water to accelerate as it passes over each one, but also slow up in between each weir. As the young fish migrating downstream encounter the accelerated flow, they seek to avoid it. The weirs, placed on a long angle to the direction of flow, create a velocity barrier extending in the same direction. The fish (on rejecting this speedup in flow) will, it is hoped, be guided along the flow barrier into a bypass situated on the far side of the flume. There they can be collected for transportation around any manmade obstruction. This device was designed at the University of Washington hydraulics laboratory and was to be tested first at the smaller flume at Carson Hatchery. If it showed promise there, it was to be tested at Grande Ronde.

The research biologist at Portland said, "What we are looking for is a method of collecting fish that is less costly from the standpoint of maintenance as well as capital outlay than the traditional methods of louvers and traveling screens. One of the problems is to design a collecting device which will allow debris in the river to pass through it, yet will not harm the fish or allow them to escape. It is hoped the Grande Ronde flume will help provide an answer."

Also being tested in the flume were a louver structure and a perforated plate screen to determine their efficiency in guiding young migrant fish.



## Shrimp

### UNITED STATES SHRIMP SUPPLY INDICATORS, JUNE 1964:

Item and Period	1964	1963	1962	1961	1960
. . . (1,000 Lbs. Heads-Off) . . .					
<b>Total landings, So. Atl. and Gulf States:</b>					
August . . . . .	-	19,769	12,340	10,944	20,441
July . . . . .	-	16,291	12,294	10,500	21,746
June . . . . .	11,000	13,134	11,309	8,233	12,427
May . . . . .	8,400	10,206	6,186	5,276	6,335
January-April . . . . .	16,694	16,043	14,652	17,521	18,013
January-December . . . . .	-	38,254	105,839	81,395	141,035
<b>Quantity canned, Gulf States 1/:</b>					
August . . . . .	-	3,121	1,355	1,090	4,427
July . . . . .	-	3,726	3,561	2,793	5,802
June . . . . .	3,300	5,234	4,913	3,438	6,920
May . . . . .	1,150	3,831	1,794	1,208	1,461
January-April . . . . .	684	947	831	317	653
January-December . . . . .	-	29,468	23,322	14,500	26,394

(Table continued on next page.)

Item and Period	1964	1963	1962	1961	1960
... (1,000 Lbs. Heads-Off) ...					
<b>Frozen inventories (as of end of each mo.):</b>					
August 31 .....	-	24,803	12,754	12,728	20,171
July 31 .....	-	25,460	13,677	14,849	17,397
June 30 .....	-	24,047	13,796	19,416	15,338
May 31 .....	26,082	24,053	13,804	24,686	17,540
April 30 .....	26,950	24,854	15,637	27,492	20,502
March 31 .....	31,428	27,970	16,607	31,345	23,232
February 29 .....	35,303	26,039	19,012	37,612	29,063
<b>Imports 3/:</b>					
August .....	-	8,598	7,381	6,743	6,407
July .....	-	11,002	8,265	6,635	7,319
June .....	-	9,439	9,397	8,065	8,932
May .....	-	11,110	11,020	8,278	9,802
January-April .....	50,625	49,937	43,383	40,825	32,531
January-December .....	-	151,530	141,103	126,268	113,418
... (c/lb., 26-30 Count, Heads-Off) ...					
<b>Ex-vessel price, all species, So. Atl. and Gulf Ports:</b>					
August .....	-	59.0	83.6	68.1	52.0
July .....	-	63.5	82.1	55.8	54.6
June .....	4/60-72	77.0	84.4	53.7	64.1
May .....	4/58-68	80.9	83.7	52.8	62.9
April .....	4/57-61	83.6	82.2	55.4	60.6
March .....	4/57-61	85.5	80.9	56.0	56.3
February .....	4/57-62	85.7	78.9	55.5	51.8
<b>Wholesale price, froz., brown (5-lb. pkg.), Chicago, Ill.:</b>					
August .....	-	75-81	110-112	76-91	64-67
July .....	-	77-97	-	70-75	72-77
June .....	80-85	95-102	102-104	67-72	76-77
May .....	72-83	100-103	96-103	67-69	74-77
April .....	71-74	100-105	94-97	69-70	74-75
March .....	72-75	102-106	94-95	69-71	65-68
February .....	73-82	102-106	93-95	69-71	65-67

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.

2/Raw headless only; excludes breaded, peeled and deveined, etc.

3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.

Note: June 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.65.

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## ROYAL-RED SHRIMP FISHING OFF FLORIDA EAST COAST GOOD IN JUNE:

Fishing for royal-red shrimp off the Florida east coast during June 1964 and the early part of July was reported to have averaged about 50 boxes of shrimp a week per vessel. One four-day trip by a commercial shrimp fishing vessel was reported to have yielded some 83 boxes of royal-red shrimp.



## Smoked Fish

### STATUS REPORT ON SMOKED FISH PROCESSING STUDIES IN GREAT LAKES REGION:

The progress on smoked fish processing studies to test the effects of certain process time/temperatures for the production of

smoked fish is outlined in a report issued May 12, 1964, by the Regional Director, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich. The studies are being conducted at the Bureau's Great Lakes Technological Laboratory in Ann Arbor.

It has been evident for some time that industry lacked technical knowledge of the variables of existing smoked fish processing methods and the devices necessary to measure temperature of fish during smoking, as well as the equipment which would permit close control of the smoking operation. Data are needed to determine whether smoked chub processed and/or stored as specified by the various regulatory agencies would be an acceptable product. Processing studies are, therefore, being carried out to provide such information. An interim report on experimental smoking of chub has been released. This report was limited to results of current thermal processing studies. It did not include microbiological evaluations. Such research is in progress under contract and will be reported separately. The following tentative conclusions stemmed from current studies:

1. Chub can be heated to an internal temperature of 180° F. for 30 minutes in a direct smoking process and yield an acceptable product of good texture.

2. A large heat capacity (greatly in excess of existing commercial smokehouses in the Great Lakes area) is required to bring the internal fish temperature to 180° F. within a reasonable period of time. Rapid heating is necessary to insure a good yield and to avoid excessive drying of product.

3. Smokehouse temperature is not fish temperature. If rapid heating of the product is to be achieved (less than 3 hours), an initial temperature differential of at least 70° to 100° F. (of house over fish) is needed. This differential should not decrease to less than 50° to 60° F. at the end of a normal smoking period.

4. Slow, prolonged heating as a result of inadequate heat input will significantly reduce yield and result in an undesirable dry and salty product. Predrying at low temperatures does not appear to accomplish any useful purpose and reduces final yield. If a relatively high process temperature is required, e.g., 180° F., optimum conditions would appear to be rapid heating with simultaneous smoking,

instead of smoking separately as in past low-temperature smoking operations. Total time exposure to heat should be kept at a minimum to maximize yield.

5. Special "point-sensitive" temperature measuring devices (thermocouples) are absolutely necessary to give true internal fish temperatures, especially for small fish such as chub. Large temperature sensitive bulbs will probably give false readings, which may be 50° to 70° F. higher than internal fish temperatures.

6. Forced air circulation and baffling in the smokehouse are essential in order to avoid hot and cold spots. This should prove of concern to the processor insofar as regulations are concerned, and also because this problem will cause product nonuniformity and low yield due to overprocessing. Similarly, size grading should merit some consideration.

7. Chub vary widely in composition and in quality. Higher fat content is usually associated with the larger fish, although fish of uniform size are also quite variable. Size, quality, and composition of fish all affect salt uptake and product behavior during smoking.

8. Salt uptake during brining depends largely on time and concentration of brine. Two- to three-percent salt in the smoked product appears an acceptable range for most consumers. Brining chub overnight (16 to 18 hours) in 20° to 25° salinometer brine or for 2 hours in 40° to 50° salinometer brine will usually yield a satisfactory salt level in the smoked product.

9. A significant lowering of the pH of the smoked fish product by employing acetic, phosphoric, or lactic acids during the brining operation, was not found to be amenable to product quality. Severe texture and flavor changes were clearly evident, and product yield was significantly lowered. Decreasing pH of the smoked product to approximately 4.5 appears quite impractical.

10. Smoking of chub after packaging or reprocessing of presmoked chub to internal temperatures of 180° F. for 30 minutes yields inferior products.

11. The smoked product (chub) does not stiffen noticeably (i. e., "freeze") at 23° F., probably due to its relatively high fat and salt

content. Thus, holding at 26° to 32° F. would probably not harm quality (texture changes due to freezing).

12. The finished smoked product should be cooled and packaged rapidly to minimize further loss of yield. Packaging should be fairly loose to permit the product to "breathe" and thus to avoid excessive surface moisture (retarding molding or slime formation).

Note: See Commercial Fisheries Review, February 1964 p. 44.



## South Atlantic Exploratory Fishery Program

### SOUTH ATLANTIC FISHERY EXPLORATIONS CONTINUED BY RESEARCH VESSEL "OREGON":

The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon left Pascagoula, Miss., on July 1, 1964, for Brunswick, Ga., to continue the Bureau's exploratory fishing program initiated in 1960 along the South Atlantic coast. Exploratory cruises in the Caribbean Sea, conducted in the past by the Oregon, will be made from Brunswick until construction of a new Gulf of Mexico exploratory fishing vessel scheduled to start in 1965, is completed.



U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.







Fig. 3 - Shows the type of tag and tagging pole provided sport fishermen participating in the Pacific Area Cooperative Marine Game Fish Tagging Program.

tag recoveries and provide additional information on the migration of marlin and sailfish since long-line gear captures both those species in addition to tuna.



## Tuna

### ALBACORE EXPLORATORY CRUISE CONDUCTED BY OREGON FISH COMMISSION:

An exploratory 10-day cruise planned primarily to determine the movements of albacore tuna off the Oregon coast in early July 1964 was announced by the Oregon Fish Commission. The fishing vessel Chelan was chartered by the Commission for the cruise. The commercial fishing fleet was to be kept informed by radio of fishing success during the cruise.

The cruise plan called for operations 40 to 140 miles offshore where investigators were to collect basic oceanographic data, explore for albacore along a predetermined cruise track, obtain albacore for tagging as an aid in studying distribution and migratory habits of the species, and attempt to determine what relationship exists between oceanographic conditions and albacore occurrence. (Oregon Fish Commission, June 24, 1964.)

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### BLUEFIN TAGGED OFF BAJA CALIFORNIA RECAPTURED NEAR JAPAN:

A bluefin tuna tagged and released 70 miles northeast of Guadalupe Island, Baja California, was recovered 22 months later

in the Sea of Japan off the northwestern corner of the island of Honshu.

The tuna was tagged and released on August 15, 1962, by a U.S. Bureau of Commercial Fisheries-California Department of Fish and Game research team, operating from the chartered purse-seiner West Point. The fish was recaptured on June 18, 1964, in a fixed trap net operated by Japanese fishermen near the coastal town of Fukaura, Nishi-Tsugaru County, Aomori Prefecture, Honshu. The bluefin traveled an estimated minimum Great Circle distance of 4,820 miles, growing from an estimated 23 pounds at the time it was tagged to 53 pounds at capture.

Fishery scientists of the Federal Government and California Department of Fish and Game initiated a cooperative bluefin tuna tagging program August 13-23, 1962. A total of 960 fish were then released. As of this past summer, a total of 168 tags had been recovered by California fishermen. This tag from the recaptured bluefin is the first to be returned from Japan.

One other tagged bluefin tuna has made a trans-Pacific migration. That fish was tagged by Inter-American Tropical Tuna Commission personnel in 1958 near Guadalupe Island, Baja California. It was recovered 5 years and 2 months later north of the Bonin Islands and had grown in weight from 30-35 pounds at tagging to about 265-267 pounds when captured.

Note: See Commercial Fisheries Review, August 1963 p. 53.



## United States Fisheries

### FISH STICKS AND PORTIONS, JANUARY-MARCH 1964:

United States production of fish sticks and fish portions amounted to 46.8 million pounds during the first quarter of 1964, according to preliminary data. Compared with the

Table 1 - U.S. Production of Fish Sticks by Months and Type, January-March 1964 1/

Month	Cooked	Raw	Total
	... (1,000 Lbs.) ...		
January .....	6,710	516	7,226
February .....	6,597	464	7,061
March .....	6,419	544	6,963
Total 1st Qtr. 1964 1/ .....	19,726	1,524	21,250
Total 1st Qtr. 1963 2/ .....	22,683	1,165	23,848
Total 1963 2/ .....	74,132	5,163	79,295

1/ Preliminary.  
2/ Revised.

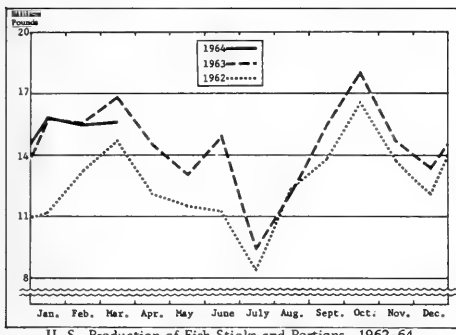


Table 2 - U. S. Production of Fish Sticks by Areas, January-March 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . .	23	16,746	23	19,163
Inland & Gulf States . . .	5	2,347	7	2,460
Pacific Coast States . . .	11	2,157	11	2,225
<b>Total</b> . . .	<b>39</b>	<b>21,250</b>	<b>41</b>	<b>23,848</b>

1/ Preliminary.  
2/ Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1960-64

Month	1/1964	2/1963	1962	1961	1960
	(1,000 Lbs.)				
January . . . . .	7,226	7,554	6,082	6,091	5,511
February . . . . .	7,061	8,241	6,886	7,097	6,542
March . . . . .	6,963	8,053	7,658	7,233	7,844
April . . . . .	-	6,546	5,719	5,599	4,871
May . . . . .	-	5,750	5,643	5,129	3,707
June . . . . .	-	6,125	5,117	4,928	4,369
July . . . . .	-	4,870	3,740	3,575	3,691
August . . . . .	-	5,686	5,760	6,927	5,013
September . . . . .	-	5,865	6,582	5,206	5,424
October . . . . .	-	8,128	6,698	6,133	6,560
November . . . . .	-	6,471	6,305	6,288	6,281
December . . . . .	-	5,995	6,027	5,618	5,329
<b>Total</b> . . . . .	<b>-</b>	<b>79,295</b>	<b>72,217</b>	<b>69,824</b>	<b>65,142</b>

1/ Preliminary.  
2/ Revised.

Table 4 - U.S. Production of Fish Portions by Months and Type, January-March, 1964/1

Month	Cooked	Breaded Raw	Total	Un-breaded	Total
	(1,000 Lbs.)				
January . . . . .	1,536	6,733	8,269	257	8,526
February . . . . .	1,739	6,238	7,977	420	8,397
March . . . . .	2,111	6,294	8,405	179	8,584
<b>Tot. 1st Qtr. 1964 1/</b>	<b>5,386</b>	<b>19,265</b>	<b>24,651</b>	<b>856</b>	<b>25,507</b>
<b>Tot. 1st Qtr. 1963 2/</b>	<b>4,139</b>	<b>19,416</b>	<b>23,555</b>	<b>814</b>	<b>24,369</b>
<b>Total 1963 2/</b>	<b>16,623</b>	<b>74,970</b>	<b>91,593</b>	<b>3,054</b>	<b>94,647</b>

1/ Preliminary.  
2/ Revised.

Table 5 - U. S. Production of Fish Portions by Areas, January-March, 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . . . .	23	15,893	23	13,696
Inland & Gulf States . . . . .	6	8,957	10	9,768
Pacific Coast States . . . . .	10	657	8	905
<b>Total</b> . . . . .	<b>39</b>	<b>25,507</b>	<b>41</b>	<b>24,369</b>

1/ Preliminary.  
2/ Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1960-1964

Month	1/1964	2/1963	1962	1961	1960
	(1,000 Lbs.)				
January . . . . .	8,526	8,173	5,077	4,303	3,632
February . . . . .	8,397	7,361	6,360	4,902	3,502
March . . . . .	8,584	8,835	7,036	5,831	4,706
April . . . . .	-	7,919	6,408	4,484	3,492
May . . . . .	-	7,293	5,818	3,879	3,253
June . . . . .	-	8,774	6,137	4,039	3,995
July . . . . .	-	4,524	4,679	3,962	4,088
August . . . . .	-	6,684	6,687	4,963	3,558
September . . . . .	-	9,621	7,180	5,745	4,631
October . . . . .	-	8,977	9,871	6,759	5,275
November . . . . .	-	8,136	7,406	5,789	4,790
December . . . . .	-	7,450	6,019	5,191	4,459
<b>Total</b> . . . . .	<b>-</b>	<b>94,647</b>	<b>78,678</b>	<b>59,847</b>	<b>49,381</b>

1/ Preliminary.  
2/ Revised.

same quarter of 1963, this was a decrease of 1.5 million pounds or 3.0 percent. Fish portions (25.5 million pounds) were up 1.1 million pounds or 4.7 percent, while fish sticks (21.3 million pounds) were down 2.6 million pounds or 10.9 percent.

Cooked fish sticks (19.7 million pounds) made up 92.8 percent of the January-March 1964 fish stick total. There were 24.7 million pounds of breaded fish portions produced, of which 19.3 million pounds were raw. Unbreaded fish portions amounted to 856,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 16.7 and 15.9 million pounds, respectively. The Inland and Gulf States ranked second with 2.3 million pounds of fish sticks and 9.0 million pounds of fish portions. The remaining 2.8 million pounds of fish sticks and fish portions were produced by firms in the Pacific States.

Total production of fish sticks and fish portions during 1963 (173.9 million pounds) was 23.0 million pounds or 15.3 percent above 1962. Fish sticks (79.3 million pounds) were up 7.1 million pounds or 9.8 percent; and fish portions (94.6 million pounds) increased 16.0 million pounds or 20.3 percent.



## U.S. Fishing Vessels

### DOCUMENTATIONS ISSUED AND CANCELLED:

May 1964: During May 1964, a total of 78 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 86 in May 1963. There were 30 documents cancelled for fishing vessels in May 1964, as compared with 42 in May 1963.

Table 1 - U.S. Fishing Vessels 1--Documentations Issued and Cancelled, by Areas, May 1964 with Comparisons

Area (Home Port)	May 1964	1963	Jan.-May 1964	1963	Total 1963
(Number)					
Issued first documents 2/:					
New England	7	3	13	10	23
Middle Atlantic	2	3	5	7	18
Chesapeake	7	8	18	17	66
South Atlantic	4	9	21	27	77
Gulf	31	31	92	97	239
Pacific	27	31	53	78	160
Great Lakes	-	-	1	2	5
Puerto Rico	-	1	-	1	2
Total	78	86	203	239	590
Removed from documenta- tion 3/:					
New England	3	5	8	24	48
Middle Atlantic	-	1	4	22	47
Chesapeake	4	4	7	10	25
South Atlantic	1	8	10	27	53
Gulf	6	13	27	55	118
Pacific	15	9	54	43	87
Great Lakes	1	2	6	7	15
Hawaii	-	-	-	1	3
Total	30	42	116	189	396

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, May 1964 2/

Length in feet	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Total
(Number)							
26 - 26.9	1	-	-	-	-	-	1
27 - 27.9	-	-	-	-	1	-	1
28 - 28.9	-	-	-	-	-	6	6
29 - 29.9	1	-	-	-	-	3	4
31 - 31.9	-	-	-	-	3	2	5
32 - 32.9	2	-	2	-	1	-	5
33 - 33.9	-	-	2	-	2	4	8
34 - 34.9	1	-	1	-	-	-	2
35 - 35.9	-	-	-	-	-	1	1
36 - 36.9	-	-	1	-	-	3	4
38 - 38.9	1	-	1	-	2	-	4
39 - 39.9	-	-	-	-	2	-	2
40 - 40.9	-	-	-	-	-	3	3
41 - 41.9	-	-	-	-	1	-	1
44 - 44.9	-	-	-	-	1	-	1
45 - 45.9	-	-	-	-	-	1	1
47 - 47.9	-	-	-	1	-	1	2
49 - 49.9	-	-	-	-	-	1	1
50 - 50.9	-	-	-	-	1	-	1
53 - 53.9	-	-	-	-	1	-	1
55 - 55.9	-	-	-	-	1	-	1
56 - 56.9	-	-	-	-	1	-	1
59 - 59.9	-	-	-	-	1	-	1
60 - 60.9	-	-	-	-	1	-	1
61 - 61.9	-	1	-	-	-	1	2
62 - 62.9	-	-	-	-	2	-	2
63 - 63.9	-	-	-	-	1	-	1
64 - 64.9	-	-	-	-	1	-	1
65 - 65.9	-	-	-	3	6	-	9
68 - 68.9	-	-	-	-	-	1	1
85 - 85.9	1	-	-	-	-	-	1
135 - 135.9	-	-	-	-	2	-	2
168 - 168.9	-	1	-	-	-	-	1
Total	7	2	7	4	31	27	78

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, May 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Total
(Number)							
5 - 9	4	-	5	-	2	2	13
10 - 19	2	-	1	-	9	14	26
20 - 29	-	-	1	1	2	6	10
30 - 39	-	-	-	-	-	2	2
40 - 49	-	-	-	-	3	2	5
50 - 59	-	1	-	-	1	-	2
60 - 69	-	-	-	-	3	-	3
70 - 79	-	-	-	3	7	-	10
80 - 89	-	-	-	-	2	-	2
90 - 99	-	-	-	-	-	1	1
180 - 189	1	-	-	-	-	-	1
310 - 319	-	-	-	-	1	-	1
320 - 329	-	-	-	-	1	-	1
520 - 529	-	1	-	-	-	-	1
Total	7	2	7	4	31	27	78

Note: For explanation of footnote, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, May 1964 2/

Horse- power	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Total
(Number)							
60	-	-	-	-	1	-	1
73	-	-	-	-	1	-	1
80-89	-	-	-	-	2	-	2
90-99	1	-	-	-	-	1	2
110-119	-	-	4	-	2	-	6
130-139	1	-	1	-	2	-	4
150-159	-	-	2	-	2	-	4
165	-	-	-	-	2	12	14
170	-	-	-	-	3	-	3
188	1	-	-	-	-	-	1
190	-	-	-	-	-	1	1
216	-	-	-	-	-	1	1
220-229	2	1	-	1	8	-	12
235	-	-	-	-	1	-	1
240	-	-	-	-	-	1	1
250	-	-	-	-	-	1	1
280	-	-	-	-	-	1	1
290	-	-	-	-	1	-	1
300-309	-	-	-	3	3	-	6
315	1	-	-	-	-	-	1
330	-	-	-	-	1	-	1
495	-	-	-	-	-	1	1
765	1	-	-	-	-	-	1
914	-	-	-	-	1	-	1
1000	-	1	-	-	-	-	1
1350	-	-	-	-	1	-	1
Total	7	2	7	4	31	27	78

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 1 redocumented vessel in May 1964 that was previously removed from the records. Vessels issued first documents as fishing craft were built: 63 in 1964; 4 in 1963; 1 in 1962; 1 in 1957; and 9 prior to 1956.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.  
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U.S. Treasury Department.

\* \* \* \* \*

April 1964: During April 1964, a total of 35 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 71 in April 1963. There were 47 documents cancelled for fishing vessels in April 1964, as compared with 56 in April 1963.

Table 1 - U.S. Fishing Vessels 1/-Documents Issued and Cancelled, by Areas, April 1964 with Comparisons

Area (Home Port)	April		Jan.-Apr.		Total 1963
	1964	1963	1964	1963	
..... (Number) .....					
Issued first documents 2/:					
New England	4	3	6	7	23
Middle Atlantic	1	2	3	4	18
Chesapeake	2	3	11	9	66
South Atlantic	1	5	17	18	77
Gulf	11	26	61	66	239
Pacific	16	31	26	47	160
Great Lakes	-	1	-	2	5
Puerto Rico	-	-	-	-	2
Total	35	71	125	153	590
Removed from documenta- tion 3/:					
New England	3	14	5	19	48
Middle Atlantic	4	6	4	21	47
Chesapeake	2	1	3	6	25
South Atlantic	4	5	9	19	53
Gulf	13	19	21	42	118
Pacific	19	8	39	34	87
Grat Lakes	-	2	-	5	15
Hawaii	-	1	-	1	3
Total	47	56	86	147	396

Note: For explanation of footnotes, see table 4.

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, April 1964<sup>2/</sup>

Length in feet	New England	Middle Atlantic	Chesa- apeake	South Atlantic	Gulf	Pacific	Total
(Number)							
27 - 27.9	1	-	-	-	-	1	2
28 - 28.9	-	-	-	-	-	1	1
29 - 29.9	-	-	-	-	-	1	1
31 - 31.9	1	-	1	-	-	-	2
33 - 33.9	1	-	-	-	2	-	3
34 - 34.9	-	-	-	-	-	1	1
35 - 35.9	-	-	1	-	-	3	3
36 - 36.9	-	-	-	-	-	1	1
38 - 38.9	-	-	-	-	1	-	1
39 - 39.9	-	-	-	-	-	1	1
40 - 40.9	-	-	-	-	-	2	2
41 - 41.9	-	-	-	-	1	-	1
42 - 42.9	-	-	-	-	-	1	1
43 - 43.9	-	-	-	-	-	2	2
46 - 46.9	-	-	-	-	-	2	2
47 - 47.9	-	-	-	-	-	1	1
48 - 48.9	1	-	-	-	-	1	1
49 - 49.9	-	-	-	-	-	1	1
50 - 50.9	-	-	-	-	1	-	1
62 - 62.9	-	-	-	-	1	-	1
63 - 63.9	-	-	-	-	-	1	1
65 - 65.9	-	-	-	1	-	-	1
68 - 68.9	-	-	-	-	1	-	1
158 - 158.9	-	1	-	-	-	-	1
Total	4	1	2	1	11	16	35

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, April 1964<sup>2/</sup>

Gross Tonnage	New England	Middle Atlantic	Chesa- apeake	South Atlantic	Gulf	Pacific	Total
(Number)							
5 - 9	2	-	2	-	-	3	7
10 - 19	1	-	-	-	4	4	9
20 - 29	-	-	-	-	-	4	4
30 - 39	1	-	-	-	-	2	3
40 - 49	-	-	-	-	-	2	2
50 - 59	-	-	-	-	1	1	2
60 - 69	-	-	-	-	3	-	3
70 - 79	-	-	-	1	3	-	4
540 - 549	-	1	-	-	-	-	1
Total	4	1	2	1	11	16	35

Note: For explanation of footnotes, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, April 1964<sup>2/</sup>

Horse- power	New England	Middle Atlantic	Chesa- apeake	South Atlantic	Gulf	Pacific	Total
(Number)							
55	-	-	-	-	-	1	1
65	-	-	-	-	-	1	1
86	-	-	-	-	-	1	1
110	1	-	-	-	1	1	3
120	-	-	-	-	-	1	1
125	1	-	1	-	-	2	2
130	-	-	-	-	2	-	2
140	-	-	1	-	-	1	1
165	-	-	-	-	-	1	1
170	-	-	-	-	2	-	2
177	-	-	-	-	1	1	2
180	-	-	-	-	-	3	3
220	1	-	-	-	2	1	4
225	-	-	-	-	-	2	2
230	-	-	-	-	1	-	1
245	-	-	-	1	-	-	1
300	-	-	-	1	1	1	3
320	1	-	-	-	-	1	2
500	-	-	-	-	-	1	1
800	-	1	-	-	-	-	1
Total	4	1	2	1	11	16	35

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.  
2/These were no documented vessels in April 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 17 in 1964; 2 in 1963; 1 in 1962; 1 in 1961; and 4 prior to 1961.  
3/Includes vessels reported lost, abandoned, forfeited, and sold, etc.  
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



## U. S. Foreign Trade

### IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 4, 1964, amounted to 17,793,706 pounds (about 847,300 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (20.7 percent) than the 22,414,914 pounds (about 1,067,400 standard cases) imported during January 1-June 29, 1963.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

\* \* \* \* \*

### PROCESSED EDIBLE FISHERY PRODUCTS, MAY 1964:

United States imports of processed edible fishery products in May 1964 were down 7.7 percent in quantity and 7.4 percent in value from those in the previous month. There was an increase in imports of frozen fish blocks this May, and those for frozen wolfish fillets (sea catfish) and fresh and frozen swordfish were up substantially. The May 1964 imports of all groundfish fillets were down from the previous month, as were those for fresh and frozen tuna, canned tuna in brine, canned sardines not-in-oil, and canned crab meat.

Compared with the same month in 1963, imports in May 1964 also were down 7.7 percent. Imports were generally low-

er for most of the leading items, including frozen groundfish fillets and fish blocks, lobster and spiny lobster, frozen shrimp, fresh and frozen swordfish, canned sardines, and canned crab meat. These were offset partly by some gain in imports of fresh and frozen tuna, mostly albacore.

In the first 5 months of 1964, imports were about unchanged in quantity from those in the same period a year earlier, but the value was up 2.7 percent. During January-May 1964 there were larger imports of frozen fish blocks and fresh and frozen tuna, but imports of canned tuna were lower as were canned sardines and canned crab meat.

U. S. Imports and Exports of Processed Edible Fishery Products, May 1964 with Comparisons

Item	Quantity				Value			
	May	Jan.	May	Jan.	May	Jan.	May	Jan.
	1964	1963	1964	1963	1964	1963	1964	1963
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
<b>Fish &amp; Shellfish:</b>								
Imports/...	37.2	48.3	205.5	205.6	11.3	12.1	60.7	59.1
Exports/...	2.6	2.0	17.5	14.6	1.2	0.7	7.6	5.6

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in May 1964 were down 13 percent in quantity and 30 percent in value from those in the previous month. In May there were fairly sharp decreases in exports of canned salmon (down 37 percent), canned mackerel (down 43 percent), and canned sardines (down 54 percent). The declines were partly offset by increased shipments of canned squid (up 342 percent), mostly all to Greece.

Compared with the same month of the previous year, the exports in May 1964 were up 30 percent in quantity and 71 percent in value. This May there were larger shipments of most of the leading canned fish export items except canned squid and canned sardines not-in-oil. Exports of canned salmon to the United Kingdom this May increased 282 percent from those in the same month a year earlier.

Processed fish and shellfish exports in the first 5 months of 1964 were up 20 percent in quantity and 36 percent in value from those in the same period of 1963. In January-May 1964 there were much larger shipments of canned mackerel (up 227 percent) and shipments of canned salmon and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown above were included in news articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed edible fishery products are reported above. The above import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, August 1964 p. 43.

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## VALUE OF U. S. FISHERY PRODUCTS EXPORTS UP SHARPLY IN 1963:

The total value of United States exports of fishery products (edible and inedible) was up sharply in 1963--59 percent higher than in 1962. The export value of edible fishery products increased 35 percent from the previous year and the value of inedible products was double that of 1962.

Value of United States Exports of Edible and Inedible Fishery Products, 1962-63		
Product	1963	1962
.. (U.S. Dollars) ..		
<b>Edible:</b>		
Salmon, fresh or frozen	2,530,062	871,806
Other fish, fresh or frozen	1,858,082	1,135,191
Shrimp, fresh or frozen	7,748,434	3,299,105
Salmon, canned	8,238,970	7,292,239
Shrimp, canned	3,053,650	2,572,187
Squid, canned	742,394	728,816
Shellfish, canned	1,263,009	1,506,680
Mackerel, canned	681,283	671,120
Sardines, canned	715,801	1,503,287
Salmon, salted, pickled or dry-cured	509,334	528,142
Other fish and shellfish	3,037,590	2,362,322
<b>Total Edible</b>	<b>30,378,609</b>	<b>22,470,895</b>
<b>Inedible:</b>		
Fish and fish-liver oils	15,636,141	6,046,852
Seal furs, dressed or dyed	5,876,523	3,850,958
Shells, unmanufactured	2,136,534	1,284,666
Fish, shellfish, and other marine-animal products	1,845,609	1,506,736
Other inedible	732,743	568,370
<b>Total Inedible</b>	<b>26,227,550</b>	<b>13,257,582</b>
<b>Grand Total</b>	<b>56,606,159</b>	<b>35,728,477</b>
Source: U. S. Exports of Domestic and Foreign Merchandise, FT 110, year 1962 and 1963.		

Principal items accounting for substantial increases in the edible fishery products group included shrimp (fresh, frozen, and canned) and salmon (fresh, frozen, and canned).

Among the inedible products, the export value of fish and fish-liver oils was up 159 percent from a year earlier. The 1963 export value of all other items in the inedible products group was much higher than in 1962.

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## AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-MARCH 1964:

Airborne fishery imports into the United States in March 1964 amounted to 485,100 pounds valued at \$233,800, down 21.6 percent in quantity and 26.7 percent in value from those in the previous month.



Total airborne imports in January-March 1964

were down 28.2 percent in quantity and 34.9 percent in value from those in the same period of 1963.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

Table 1 - U. S. 1/ Airborne Imports of Fishery Products, January, February, and March 1964

Product and Origin 2/	Jan.-Mar. 1964		Jan.-Mar. 1963	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
<b>Fish:</b>				
Portugal . . . . .	-	0.1	-	-
Mexico . . . . .	-	42.1	11.6	37.4
British Honduras . . . . .	-	1.1	0.2	0.7
United Kingdom . . . . .	1.0	1.8	0.5	0.9
France . . . . .	3.6	6.9	0.3	-
Israel . . . . .	-	-	1.3	0.8
Venezuela . . . . .	-	-	4.6	1.7
Denmark . . . . .	-	-	-	0.2
Canada . . . . .	7.8	2.8	3.8	1.1
Iceland . . . . .	0.8	0.6	1.0	0.6
<b>Total fish . . . . .</b>	<b>13.2</b>	<b>12.1</b>	<b>54.8</b>	<b>17.3</b>
<b>Shrimp:</b>				
El Salvador . . . . .	34.6	20.0	12.0	40.5
Nicaragua . . . . .	1.0	0.9	-	5.6
Costa Rica . . . . .	65.1	34.9	56.2	33.6
Panama . . . . .	141.4	78.5	47.9	28.7
Venezuela . . . . .	477.2	160.4	379.8	175.8
<b>Total shrimp . . . . .</b>	<b>719.3</b>	<b>294.7</b>	<b>495.9</b>	<b>248.1</b>
<b>Shellfish other than shrimp:</b>				
Mexico . . . . .	-	5.8	2.0	3.2
British Honduras . . . . .	33.0	23.8	23.0	20.8
Honduras . . . . .	6.7	7.3	1.7	1.3
Nicaragua . . . . .	82.9	18.1	10.6	7.2
Costa Rica . . . . .	-	-	9.3	9.5
Jamaica . . . . .	16.1	11.2	9.7	9.1
British Guiana . . . . .	-	-	-	8.6
Canada . . . . .	-	-	-	1.2
Dominican Republic . . . . .	-	0.5	0.1	-
Bahamas . . . . .	-	-	6.5	3.1
Haiti . . . . .	-	-	1.2	0.6
<b>Total shellfish (excl. shrimp) . . . . .</b>	<b>78.7</b>	<b>60.4</b>	<b>68.3</b>	<b>53.7</b>
<b>Grand Total . . . . .</b>	<b>811.2</b>	<b>367.2</b>	<b>619.0</b>	<b>319.1</b>

1/For explanation of footnotes, see table 2.

Table 2 - U. S. 1/ Airborne Imports of Fishery Products, January-March 1964 with Comparative Data

Product and Origin 2/	Jan.-Mar. 1964		Jan.-Mar. 1963	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
<b>Fish:</b>				
Portugal . . . . .	0.1	0.1	-	-
Mexico . . . . .	79.5	22.4	78.6	23.7
British Honduras . . . . .	1.8	0.4	26.2	6.6
Honduras . . . . .	-	-	14.1	3.6
Jan . . . . .	-	-	2.0	8.2
United Kingdom . . . . .	1.7	3.2	0.9	2.1
Iran . . . . .	-	-	1.2	7.4
France . . . . .	3.9	7.2	0.4	0.3
Israel . . . . .	1.3	0.8	-	-
Venezuela . . . . .	4.6	1.7	-	-
Ireland . . . . .	-	-	0.8	0.3
Denmark . . . . .	0.2	0.1	-	-
Canada . . . . .	13.2	4.3	-	-
Iceland . . . . .	1.8	1.2	-	-
<b>Total fish . . . . .</b>	<b>108.1</b>	<b>41.4</b>	<b>124.2</b>	<b>52.2</b>
<b>Shrimp:</b>				
Guatemala . . . . .	-	-	85.9	45.5
El Salvador . . . . .	87.1	50.9	127.6	89.2
Honduras . . . . .	-	-	5.8	3.3
Nicaragua . . . . .	6.6	4.1	73.3	21.7
Costa Rica . . . . .	139.9	77.8	246.3	119.5
Panama . . . . .	249.6	145.2	489.3	259.9
Venezuela . . . . .	1,138.0	466.6	1,108.6	538.0
Ecuador . . . . .	-	-	42.7	15.0
France . . . . .	-	-	2.6	0.9
<b>Total shrimp . . . . .</b>	<b>1,621.2</b>	<b>744.6</b>	<b>2,181.6</b>	<b>1,092.0</b>

(Table continued on next column.)

Product and Origin 2/	Jan.-Mar. 1964		Jan.-Mar. 1963	
	Qty. 3/	Value	Qty. 3/	Value
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
<b>Shellfish other than shrimp:</b>				
Mexico . . . . .	9.0	4.8	66.5	39.0
British Honduras . . . . .	67.6	47.0	90.0	69.4
El Salvador . . . . .	-	-	3.6	2.8
Honduras . . . . .	8.4	8.6	1.6	0.8
Nicaragua . . . . .	40.2	30.9	38.3	31.4
Costa Rica . . . . .	9.3	9.5	73.8	60.1
Jamaica . . . . .	32.0	26.2	38.6	31.9
Netherlands Antilles . . . . .	-	-	29.1	18.3
Colombia . . . . .	-	-	0.8	2.5
Ecuador . . . . .	-	-	1.1	1.5
Tunisia . . . . .	-	-	-	-
British Guiana . . . . .	8.6	1.6	-	-
Canada . . . . .	1.2	0.9	-	-
Venezuela . . . . .	-	-	13.7	6.0
Dominican Republic . . . . .	0.5	0.1	6.2	5.0
Bahamas . . . . .	6.5	3.1	-	-
Haiti . . . . .	2.7	1.4	-	-
<b>Total shellfish (excl. shrimp) . . . . .</b>	<b>186.0</b>	<b>134.1</b>	<b>363.3</b>	<b>268.7</b>
<b>Grand total . . . . .</b>	<b>1,915.3</b>	<b>920.1</b>	<b>2,669.1</b>	<b>1,412.9</b>

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/When weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F, o, b, point of shipment. Does not include U. S. import duties, air freight, or insurance.

Notes: These data are included in the overall import figures for total imports, i. e., these figures are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, January, February, and March 1964, U. S. Bureau of the Census.

## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, JULY 1964:

The July 1964 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) moved up only 0.9 percent from the previous month. Substantial price increases this July for most fresh or frozen salt-water and fresh-water fishery products were offset by price declines in the processed fresh fish and shellfish group. But prices for processed frozen fishery products were all higher than in June 1964. At 106.6 percent of the 1957-59 average, the index this July was 3.1 percent lower than for the same month a year earlier. Prices this July were generally below those in July 1963 except for several fresh and frozen salt-water fishery products and a number of the canned fish items.

Considerably higher prices prevailed this July than in the previous month for ex-vessel large haddock (up 17.8 percent) at Boston and for western fresh halibut (up 5.6 percent) at New York City because of lighter-than-normal seasonal landings. July 1964 prices also were above those for June for western fresh king salmon (up 3.6 percent), Great Lakes drawn whitefish (up 23.5 percent), and fresh round yellow pike (up 20.0 percent). Those higher prices were responsible for the 8.1 percent increase from June to July in the subgroup index for drawn, dressed, or whole finfish. As compared with July 1963, the subgroup index this July was up 4.5 percent because of higher prices for all items except fresh-water fish.

Much lower prices from June to July for South Atlantic fresh shrimp (down 16.0 percent) at New York City were directly responsible for the 8.1 percent decline in the subgroup index for processed fresh fish and shellfish. The steep price drop for shrimp was partly offset by higher prices for small haddock fillets (up 7.9 percent) at Boston as a result of the higher ex-vessel prices for fresh haddock. Compared with Ju-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1964 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			July 1964	June 1964	July 1964	June 1964	May 1964	July 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					106.6	105.6	105.4	110.0
Fresh & Frozen Fishery Products: . . . . .					109.3	107.8	107.4	114.3
Drawn, Dressed, or Whole Fish: . . . . .					114.9	106.3	107.5	110.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.10	88.6	75.2	60.5	83.4
Halibut, west., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.40	.36	118.3	107.0	101.5	106.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.93	.89	129.2	124.7	127.8	122.3
Whitefish, L.Superior, drawn, fresh	Chicago	lb.	.53	.43	78.3	63.4	92.5	88.0
Yellow pike, L.Michigan & Huron, rnd., fresh	New York	lb.	.51	.43	83.5	69.6	94.2	100.7
Processed, Fresh (Fish & Shellfish): . . . . .					105.5	114.8	117.2	120.8
Fillets, haddock, smd., skins on, 20-lb. tins	Boston	lb.	.35	.32	83.8	77.7	71.6	93.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.84	1.00	98.4	117.2	116.0	106.7
Oysters, Shucked, standards	Norfolk	gal.	7.00	7.00	118.0	118.0	126.5	143.3
Processed, Frozen (Fish & Shellfish): . . . . .					102.5	98.7	94.7	107.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.37	95.0	92.5	92.5	100.1
Haddock, smd., skins on, 1-lb. pkg.	Boston	lb.	.37	.35	108.5	101.1	104.1	102.6
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.30	108.7	105.2	105.2	116.6
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.84	.82	99.0	96.6	88.3	109.7
Canned Fishery Products: . . . . .					102.2	102.2	102.2	102.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.25	22.25	97.0	97.0	97.0	104.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.50	11.50	102.1	102.1	102.1	99.0
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.0	105.9	103.9	100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.81	8.81	113.0	113.0	113.7	104.0
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								
2/Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.								

<sup>1/</sup>Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

<sup>2/</sup>Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.

ly 1963, price in the subgroup this July were down for all products and the index was lower by 12.7 percent.

All products in the subgroup for processed frozen fish and shellfish were higher-priced this July and the index rose 3.9 percent from the previous month. Prices for haddock fillets at Boston were up 7.3 percent from June to July, and were higher by 5.8 percent as compared with July 1963. Prices this July were higher for other species of fillets in the subgroup and wholesale prices for frozen shrimp at Chicago rose 2 cents a pound from the previous month. The subgroup index this July was lower than for the same month a year earlier by 5.0 percent--prices were lower for all products but haddock fillets (up 5.8 percent).

The July 1964 subgroup index for canned fishery products at 102.2 percent of the 1957-59 average was unchanged from the previous month. Prices for each of the canned fish items were at about the same price level as the previous two months except for California canned jack mackerel which increased slightly from May to June as a result of low inventories.

Prices for canned Maine sardines were steady during July with a reported new season pack of some 300,000 cases toward the end of that month--less than half the pack for the same period in 1963. As compared with July 1963, the subgroup index this July was lower by 0.6 percent because of a decline in prices for canned pink salmon (down 7.3 percent) due to large inventories as the new season got under way. Prices for other canned fishery products this July were higher than in July 1963.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.





## International

### FISHING LIMITS

#### BRITISH-NORWEGIAN DISCUSSIONS:

An account of discussions between the United Kingdom and Norway on fishing limits appeared in the British *Hansard* (Parliamentary Debates), volume 697, no. 134, of July 2, 1964, as follows:

"Officials of the United Kingdom and Norway met in London from 17th to 23rd June to discuss the arrangements to be made, in accordance with the Note supplementary to the Anglo-Norwegian Fishery Agreement of 17th November, 1960, when the New United Kingdom fishery limits are introduced. In that Note Her Majesty's Government undertook to make for Norwegian vessels off the United Kingdom arrangements corresponding to those made under the Agreement for British vessels off Norway.

"Subject to the conclusion of a formal Agreement between their Governments in this matter, officials recommended that until 31st December, 1984, Norwegian vessels which would otherwise be excluded from the new fishery limits might continue to fish in the zone between six and twelve miles from the baselines of the territorial sea of the United Kingdom (a) for dogfish, in the area extending from a line due west of Ard an Runair (North Uist) northwards to a line due east of Start Point (Orkney) including the areas around the Flannan Islands, the Shetland Islands and Fair Isle and the off-lying islands of the St. Kilda Group, North Rona and Sulisker, Sule Skerry and Stack Skerry; and (b) for basking sharks, in the same area as for dogfish and also in the area between a line due west of the Mul of Oa (Islay) and a line due west of Ard an Runair.

"Norwegian vessels might also continue to fish for dogfish and basking sharks in these areas up to a limit of three miles from United Kingdom baselines until 31st December 1965, or, where straight baselines or bay

closing lines more than ten miles long are drawn, until 31st December, 1966.

"If any fundamental change were to take place in the character of Norwegian fishing in these areas, Her Majesty's Government would review the position with the Norwegian Government. Any right to fish for dogfish or basking sharks in these areas extended to a third country would also be extended to Norway. The Government of the United Kingdom would enforce for Norwegian vessels fishing in these areas rules of conduct which for the time being would be those of the North Sea Fisheries Convention, 1882; the Government of the United Kingdom would not require Norwegian vessels to observe any conservation measures which might have the effect of abridging their right to fish for dogfish or basking sharks, unless such measures were accepted by the Government of Norway." (United States Embassy, London, July 8, 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 70; March 1964 p. 35; February 1964 p. 59.

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-APRIL 1963-1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Production and exports of fish meal by FEO countries during January-April 1964 were up substantially from that same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-April 1963-1964

April 1964, January-April 1963					
Country	April		Jan.-Apr.		Total
	1964	1963	1964	1963	
	(1,000 Metric Tons)				
Chile . . . . .	10.1	1/	53.0	1/	1/
Angola . . . . .	2/	1.7	2/	9.1	30.0
Iceland . . . . .	8.7	4.7	40.5	26.8	99.1
Norway . . . . .	24.1	6.0	77.9	28.6	102.1
Peru . . . . .	142.5	96.3	531.0	451.5	1,159.4
So. Africa (including S.W. Africa) . . . . .	18.1	13.7	62.7	42.2	198.8
Total . . . . .	203.5	122.4	765.1	558.2	1,589.4

## International (Contd.):

Country	April		Jan.-Apr.		Total
	1964	1963	1964	1963	1963
	(1,000 Metric Tons)				
Chile	13.3	1/	60.8	1/	86.8
Angola	2/	1.3	2/	8.5	31.5
Iceland	10.1	8.7	31.1	30.2	87.2
Norway	31.6	4.0	74.9	15.0	132.2
Peru	158.5	129.2	654.4	442.6	1,159.2
So. Africa (including S. W. Africa)	32.9	34.5	96.6	81.5	238.0
Total	246.4	177.7	917.8	577.8	1,734.9

1/ Data not available. Chile became a member of FEO at the end of 1963.

2/ Data not reported. January 1964 exports were 4,800 tons; January 1964 production was 5,600 tons.

During the first 4 months of 1964, Peru accounted for 69.4 percent of total fish-meal exports reported by FEO countries, followed by Norway with 10.2 percent, South Africa with 8.2 percent, Chile with 6.9 percent, and Iceland with 5.3 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 15, 1964.)

## FISH OIL

## WORLD EXPORTS, 1963:

World gross exports of fish oil (including fish-liver oil) reached a record 480,500 short tons in 1963, reflecting the expansion in fish-oil shipments from the United States. World fish-oil exports in 1963 were up about 5 percent from those in 1962 and were more than twice the 1955-1959 average.

Peru, the United States, Iceland, and the South Africa Republic are the most important world suppliers of fish oil, accounting for nearly 75 percent of the world's gross exports and about 95 percent of the world's net exports of fish oil in 1963. Although several European countries export sizable quantities of fish oil, the area as a whole is a net importer and takes most of the world's exports of fish oil. Much of the domestic production of fish oil in Europe is retained for domestic consumption, normally in the country of origin, or exported to other European countries as in the case of Iceland, Portugal, Western Germany, and Denmark. In addition, Norway, Western Germany, and the Netherlands import large quantities of fish oil for further processing and export largely to other European countries.

Exports from the United States reached a record 131,200 tons in 1963, more than double the exports of 1962. The increase enabled the United States to surpass Peru and become

Continent and Country	1963	1962	1961	1960	1959	1958	Average 1955-59
(1,000 Short Tons)							
North America:							
Canada	6.4	3.2	4.4	13.2	14.8	6.0	8.5
Mexico	2	3	8	3/	7	7	7
United States	131.2	61.5	61.2	71.8	72.2	47.0	64.1
Total No. America	137.8	65.0	66.4	87.0	87.7	53.7	73.3
South America:							
Argentina	.5	.4	6.6	1.0	.4	.8	.5
Chile	12.7	12.0	5.1	6.6	.1	-	4.1/
Peru	121.3	166.0	112.8	38.6	18.9	1.8	5.5
Total So. America	134.5	178.4	118.5	46.2	19.4	2.6	6.0
Europe:							
Denmark	22.9	16.8	10.5	7.4	16.1	12.6	12.5
France	4.0	2.8	2.7	2.4	1.6	.4	1.1
Germany, West	19.7	22.9	25.3	26.2	31.6	17.9	17.9
Iceland	71.2	72.5	55.2	54.5	18.9	27.4	21.1
Netherlands 5/ 6/	2.8	2.6	5.2	7.8	16.0	13.0	10.4
Norway 6/	21.2	18.6	24.0	18.4	21.8	18.8	21.3
Portugal	10.5	6.7	7.4	4.9	5.7	5.5	5.1
Sweden	3.4	2.0	3.4	2.5	3.0	2.0	2.5
United Kingdom	2.7	2.6	3.2	3.7	3.7	3.6	3.8
Other countries (incl. U.S.S.R.) 7/	2.6	2.9	2.8	2.0	2.3	1.4	1.7
Total Europe	161.0	150.4	119.7	129.8	120.7	103.6	97.4
Africa:							
Angola	3.4	2.9	3.3	7.3	5.6	9.4	8.1
Morocco	5.7	4.9	4.5	5.7	4.3	4.3	2.7
So. Africa Republic 8/	35.3	50.4	50.3	37.4	26.6	18.5	15.2
Total Africa	44.4	58.2	58.1	50.4	36.5	32.4	26.0
Asia and Oceania:							
Japan	2.0	3.2	2.7	3.8	3.6	6.6	5.8
Other countries 7/	.8	.7	.8	1.0	1.7	1.2	1.2
Total Asia and Oceania	2.8	3.9	3.5	4.8	5.3	7.8	7.0
World total	480.5	455.9	366.2	318.2	269.6	200.1	209.7

1/ Hardened fish oils have been included wherever separately classified in export statistics.

2/ Preliminary.

3/ Under 50 tons.

4/ 1959 only.

5/ May include some whale oil prior to 1960.

6/ Excludes sizable quantities of hardened fish oils exported annually which are not separately classified in trade returns.

7/ Includes estimates for minor exporting countries.

8/ Including the territory of South-West Africa.

the leading world supplier. Exports from the other major suppliers, except Iceland, declined substantially. (World Agricultural Production and Trade, June 1964, U. S. Department of Agriculture Foreign Agricultural Service.)

## FOOD AND AGRICULTURE ORGANIZATION

TUNA RESEARCH MEETING  
HELD IN ROME:

A meeting of the Expert Panel for the Facilitation of Tuna Research of the Food and Agriculture Organization (FAO) was held for the first time on June 8-12, 1964, in Rome.

The Panel, which was set up in 1963 by FAO's former Director-General, is made up of 11 tuna research scientists from 9 countries. The scientists are appointed in their individual capacities and not as representatives of organizations or governments.

One of the Panel's principal tasks will be to stimulate governments to implement rec-

## International (Contd.):

ommendations passed at the World Scientific Meeting on the Biology of Tunas and Related Species held in La Jolla, Calif., in 1962. The recommendations, most of them technical, have already been transmitted to member countries.

The Panel will seek to develop international standards for collection, collation, and publication of data, as well as cooperative programs for tuna research. While the tuna is the most important fish species in international commerce, there are still many factors concerning it which are unknown. The Panel, was formed for the purpose of bringing those unknown factors to light. (Food and Agriculture Organization, Rome, June 3, 1964.)

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#### GREATER INTERNATIONAL DISCIPLINE URGED IN HARVESTING WORLD'S OCEANS:

Governments have been called on to try harder to work out an international code of discipline for harvesting the world's oceans. The call came from the former head of the Food and Agriculture Organization's (FAO) Fisheries Division. Writing in the May/June issue of the Freedom-From-Hunger Campaign (FFHC) News, he says: "Any appeal for the establishment of such a code should not be directed to men's sentiments or to their fears, but to their enlightened self-interest, or even selfishness if you like."

The title of the article by the former FAO official is "The Warning of the Blue Whale." It is one of 9 articles, all concerned with world fishing, that appear in the May/June issue of the FFHC News.

According to the article, the blue whale, the largest mammal known to have appeared on earth, is now commercially extinct. "It has all but vanished from the seas because the nations that hunted it were unable to agree on a common and enlightened conservation policy for the world's whale resources," he writes.

Other articles in this issue of FFHC News cover modern methods of finding and catching fish, whaling, inland water fishing in Syria, mechanization of small fishing craft with outboard motors, fishing boat design, tuna fishing, preservation of fish and fish products, and pearl farming.

The article on the blue whale refers to the inability of the whaling nations to agree a few years ago to limit their catches of that whale species. The article says, "In the future, if we are to protect the sea's natural resources intelligently, we must have better treaties than the one that governed the hunting of the blue whale." (Food and Agriculture Organization, Rome, June 8, 1964.)

## GEAR

#### SOVIET AND U.S. DELEGATIONS DISCUSS FISHING GEAR CONFLICTS IN NORTHEASTERN PACIFIC OCEAN:

Delegations of the United States of America and the Union of Soviet Socialist Republics concluded a two-week meeting in Juneau, Alaska, June 24, 1964, on fishery problems of mutual interest. The meeting was convened in accordance with an agreement between the two Governments, the basis for which was established in a meeting in Moscow in early March 1964.

The purpose of the meeting in Juneau was to work out detailed arrangements for preventing or diminishing conflicts between United States and Soviet fishing gear in the northeastern Pacific Ocean.

The United States Delegation was headed by William C. Herrington, Special Assistant to the Under Secretary of State; Governor William A. Egan was a member of the United States Delegation, together with Admiral George Synon, Commandant, 17th Coast Guard District, and representatives of the Department of the Interior, the Alaska Department of Fish and Game, and representatives of the United States fishing industry.

The Soviet Delegation was headed by A. S. Babaev, Chief Specialist of the Union of Soviet Socialist Republics State Production Committee of the Fishing Industry, and included Dr. V. G. Lafitsky, Senior Expert of this Committee, Viktor Novasb, Third Secretary of the Soviet Embassy in the United States of America, and a number of experts from the Soviet fishing industry.

The meeting resulted in the development of a draft agreement which the two Delegations recommended their Governments conclude through appropriate channels. The agreement provides for the establishment of a number of areas in the vicinity of Kodiak Island in which mobile gear will not operate during the period

### International (Contd.):

July-October, inclusive, and establishes the procedures for amending (by mutual agreement between the Chief of the Soviet Fleet and local United States fishery officials) the boundaries of those areas or the periods during which they are reserved for fixed gear. It also provides for establishing new areas by mutual agreement.

The draft agreement establishes, in addition, a system of direct radio communication between the Soviet fleet and fishery officials in Alaska. This system can be used for reporting to the Soviet fleet the positions of the United States king crab vessels outside of the areas mentioned above in order that special precautionary measures can be taken to avoid damage to the vessels.

Under the provisions of the agreement the United States will undertake special research in cooperation with the Union of Soviet Socialist Republics in order to develop more effective means of marking and detecting fixed gear of various types.

The agreement would not prejudice existing rights of either Government.

During the meeting the representative of the United States raised the question of precautionary measures to avoid possible damage to fishing gear when the United States long-line fleet and the Soviet trawl fleet are operating in the same areas at the same time. The United States representative noted the urgency of the problem.

Because of technical difficulties and because the meeting was not prepared to deal definitively with this problem, the representatives of the United States of America and the Union of Soviet Socialist Republics agreed that the problem should be referred to the two Governments for their consideration by appropriate means.

The report of the meeting, including the recommendations, was signed by the two representatives in the office of Governor William A. Egan on June 24, 1964.

### GREAT LAKES FISHERY COMMISSION

### ANNUAL MEETING HELD AT ANN ARBOR, MICHIGAN:

The Great Lakes Fishery Commission held its annual meeting at Ann Arbor, Mich.,

June 17-18, 1964. The Commission is an international body (United States and Canada) formed to find means of protecting, and in the case of some species, rehabilitating the commercial stocks of the Great Lakes.

Under the chairmanship of Dr. D. L. Pritchard, Canadian Department of Fisheries, the Commission reviewed current sea lamprey control and lake trout rehabilitation programs, and held discussions on future use of Great Lakes fishery resources.

At the meeting, continued low levels were reported in Lake Superior barrier catches of the sea lamprey, a predator that has decimated lake trout populations in the upper Great Lakes since it moved into them shortly before World War II. As of June 12, 1964, a total of 9,184 lampreys had been trapped at 30 barriers in United States and Canadian spawning streams as compared with 7,246 lampreys taken by the same date a year earlier. Both figures are a great reduction from the 52,477 lampreys taken in 1961, when chemical treatment of spawning streams had not been completed. It was reported that the spawning run also appeared to have started earlier this year.

In reviewing the program of chemical treatment of Lake Superior spawning streams, the Commission's Chairman said, "Last year two new lamprey-producing streams in northern Lake Superior were treated and a number of treated streams on both shores containing ammocetes (lamprey larvae) were re-treated. We cannot be sure, at the moment, that those treatments have caused a further overall reduction in the lamprey population because their effect will not be evident until next spring (when the lamprey again come into the streams to spawn).

"A question which we must consider is-- what level must lamprey be reduced for the program to be successful? Can lake trout be expected to recover and provide a significant fishery if the population is not reduced further than is presently indicated by the barrier catches? The questions cannot be answered properly at this time, since we do not know enough about the relationship between lamprey abundance and the loss of lake trout. We are, therefore, at a point in our program where, while we continue to see improvement in Lake Superior, we cannot predict without qualification the final result."

## International (Contd.):

The Chairman said programs of treatment are being continued in Lake Michigan streams, and 90 Lake Huron streams have been located for possible future treatment.

The Commission's Lake Trout Rehabilitation Committee again reported favorable findings on lake trout survival in Lake Superior. Some 10.7 million hatchery-reared fish have been planted there since 1958 in an organized effort to re-establish an adequate breeding population.

The Chairman of the Rehabilitation Committee reported that information obtained from inshore waters indicated a further increase in the size and abundance of marketable lake trout on both sides of the lake in 1963. "Progressive increases in the abundance of the larger and older trout has apparently resulted from a continuation of the improved survival noted in 1962," he said. "On the other hand, reduction in the numbers of native fish in the smaller and mid-size range has continued due to the progressive decline of natural spawning after 1959. The scarcity of young native fish in many of the inshore areas of the lake, however, has been offset by the introduction of substantial numbers of hatchery-reared fish."

The incidence of lamprey-wounded lake trout in catches on both sides of the lake remained generally close to the low levels established in 1963, the report added.

An increase in the proportion of hatchery-reared fish in the 1963 catches was reported. In both Wisconsin and Michigan waters planted lake trout provided about 50 percent of the legal portion of the catch and 90 percent or more of the undersized portion. The contribution of hatchery-reared trout to the Canadian catches rose from 33 percent in 1962 to 58 percent in 1963. In 1963, a total of 2,311,000 marked lake trout were planted into Lake Superior, an increase of nearly a half million over 1962. The 1964 stocking consisted of a planting of some 2.6 million yearling lake trout--about 472,000 fish for release in Canadian waters and over 2.1 million in United States waters.

At an election of new officers, D. L. McKernan (Director of the U. S. Bureau of Commercial Fisheries) was elected chairman of the Commission for the next two years and

Dr. D. L. Pritchard was elected vice-Chairman.

Note: See Commercial Fisheries Review, February 1964 p. 62.

## INTERNATIONAL ATOMIC ENERGY AGENCY

**RECOMMENDATIONS MADE ON  
RADIATION CONTROL OF HARMFUL  
ORGANISMS IN FOODS AND ANIMAL FEEDS:**

The following recommendations were made by a Panel of the International Atomic Energy Agency (IAEA) on "Radiation Control of Harmful Organisms Transmitted by Food and Feed Products with Particular Reference to Salm-onellae:"

A. As international trade with food and feed products increases, the transmittance of pests and diseases by such commodities tends to become an ever increasing problem. Concern has already been felt for some time about the spread of salmonellae and other pathogenic microorganisms, partly due to the international distribution of food and feeds produced in areas where it is difficult to maintain satisfactory sanitary conditions. However, even where good sanitary conditions are maintained contamination by harmful organisms remains a problem.

The Panel thoroughly reviewed various control measures, with particular attention to the use of ionizing radiation. Control was considered in the light of the present situation concerning the epidemiology of salmonellosis and a detailed assessment was made of the products that are known or potential sources of salmonellae and other harmful microbes.

B. It was the unanimous opinion of the Panel that salmonellosis constitutes a serious problem and that conventional methods such as heat treatment, the use of chemicals, and improved hygiene are not always satisfactory in dealing with this problem. It was also the unanimous opinion of the Panel that radiation treatment of some infected products is a promising alternative and in some cases the most practical way of freeing such products of salmonellae and similar organisms. It was pointed out that irradiation or any other treatment of the final product is supplementary to and does not replace good hygiene and that the best possible sanitary conditions should always be maintained.

C. The Panel drew attention to the lack of information regarding contamination of fish meal and other meals and that more detailed knowledge is needed with regard to number and types of microorganisms present in those products from different countries. It was recommended that IAEA should inform the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) about the situation and ask them to stimulate research on this problem in their Member States.

D. It was also recommended that IAEA should call the attention of WHO to the need to investigate and set up international standard methods for sampling and for detecting salmonellae and other harmful organisms present in foods and feeds.

E. The Panel unanimously agreed that additional research, both of a fundamental and applied nature, is

## International (Contd.):

still needed and that the best way in which IAEA can further the field of radiation control is to provide financial support for such research via its research contract program. More specifically, the Panel recommended research along the following lines:

(1) In Microbiology:

(a) Study of radiation resistance of additional serotypes of Salmonella;

(b) Study of the effects of water activity and of the lipid content of the irradiated products on radiation resistance of Salmonella;

(c) Effect of media and temperature on recovery of irradiated salmonellae with special reference to the use of Salmonella selective media.

This is an initial program for basic information. When a particular product is being studied it would be desirable to investigate also radiation inactivation of other pathogens, e.g. Bacillus anthracis.

(2) In Wholesomeness:

(a) More direct experiments should be made on the effect of radiation on the nutritive value of protein with particular reference to animal feeds. Animal tests as well as chemical and microbiological estimates of protein value should be made.

(b) More attention should be given to the effect of the dose levels being considered here (0.5 - 1 Mrad) on vitamin destruction in the individual foods where vitamin content might be important.

The Panel wishes to draw the attention of the "Expert Committee on Wholesomeness of Irradiated Food" being set up by FAO/WHO/IAEA to the problem of the possible toxicity of irradiated animal feeds and to its suggestion that the use of such feeds should be permitted.

(3) In Technology:

(a) When dose requirements for particular products have been fixed, detailed cost studies should be made in terms of a particular situation so that the best way of treatment can be established.

(b) A detailed on-the-spot analysis should always be made in each situation before deciding on location of an irradiation plant at import or export.

F. The Panel also recommended that IAEA support requests for the training of scientists from countries where radiation control of salmonellae and other pathogens might be considered. Long-term training as well as shorter study periods in laboratories where active research in this field is underway is highly desirable. It is essential that such training should be linked with the possibility for the trained scientist to perform research work on return to his home country.

G. The Panel finally recommended that the lectures presented at Gents, as well as an edited version of the discussions should be published by IAEA in its Technical Bulletin Series. The publication should be given as wide a distribution as possible in order to

draw international attention to the problem of transmission of pests and diseases by food and feed products and to the potential use of atomic energy for its control. (Irradiation des Aliments--Food Irradiation, January-March 1964.)

## INTERNATIONAL WHALING COMMISSION

## 16TH ANNUAL MEETING HELD:

The 16th Annual Meeting of the International Whaling Commission was held at Sandefjord, Norway, June 22-26, 1964. The Commission (established in 1948 to preserve dwindling whale stocks through scientific study and regulation of catches) at this meeting reviewed progress in the program of scientific studies of whale resources which is intended to serve as an objective basis for effective conservation measures. At the 17-nation meeting, no agreement was reached on the Nineteenth Antarctic whale catch quota. After the meeting, the four whaling nations--Japan, U.S.S.R., Norway, and the Netherlands--informally agreed on a catch quota of 8,000 blue-whale units for the 1964/65 Antarctic pelagic whaling season. That quota was a reduction of 2,000 units from the 1963/64 season catch limit of 10,000 units.

This further reduction in the catch limit demonstrates the concern felt over the diminishing whale stocks in the Antarctic. Out of the total 10,000 blue-whale units allocated the four countries in the 1963/64 season, only 8,425 units were caught. In the 1962/63 season, the pelagic expeditions caught 11,306 blue-whale units out of a total quota of 15,000 units.

Under the quota for the coming season, Japan's share is 3,680 blue-whale units; Norway 2,240 units; U.S.S.R. 1,600 units; and the Netherlands 480 units.

Japan's share is based on 46 percent of the international whale catch quota. Japanese whaling firms were reported to have begun organizing their whaling fleets. Negotiations had been pending for the purchase by 3 Japanese firms of the Dutch whaling factoryship Willem Barendsz (26,830 gross tons), but in view of developments it appeared that the negotiations might be terminated.

Note: See Commercial Fisheries Review, August 1963 p. 78.

## NORDIC COUNTRIES

## NINTH NORDIC FISHERIES CONFERENCE:

At the Ninth Nordic Fisheries Conference held in Reykjavik this past summer, Norway's Director of Fisheries stressed the necessity

## International (Contd.):

of regulating total fishing operations in the North Atlantic to insure good and constant fishing in the future. He said that if cooperation cannot be obtained among the parties concerned, then individual countries will have to take their own measures.

The conference was attended by the fisheries committees of the respective governments and representatives of the various branches of the fishing industry of each country (Denmark, Finland, Norway, Sweden, and Iceland).

The opinion of Norway's Director of Fisheries was that trawl fishing is the major cause of the lower stocks of fish in all age groups. European fishing nations, he said, must find ways to guard the fish stocks. He said that international measures taken in that field have not been effective because the preliminary preparations for implementing them took too long. This state of affairs, he claimed, is especially true in the North Atlantic where a period of 9 years of no rules at all was followed by 9 years of unsatisfactory rules. He recommended regulations regarding the size of the mesh of nets and the necessity for international supervision of fishing vessels, restrictions on the number of fishing boats, a special quota to be allowed for each kind of fish for all fishing areas, and individual country quotas. He recalled the demands made by coastal nations at the Geneva Conference in 1958 and 1961.

According to the chief of the Icelandic Fisheries Institute, the major purpose of the fisheries conference was to provide a meeting place for the Nordic fisheries specialists to get together and exchange ideas, views, and experiences on common problems. His address to the conference stressed the importance and wealth of fishing to Icelanders. He described it as a "rich natural resource" and remarked that Iceland's fishery catch has increased 19 times in the past 50 years. Iceland's share in the total fish catch in her waters has also grown (presently about 60 percent) since few other nations fish in Icelandic waters. The only countries in Europe that have larger fish catches at the present time are the U.S.S.R., Norway, Spain, and Great Britain. But while Iceland's fishery catch is larger in quantity than that of many other countries, in value it is not as great because so much of Iceland's catch goes into reduc-

tion or into semiprocessed stages which are used by other nations as raw material to produce the more valuable finished food products. He suggested that perhaps Iceland concentrates too much on building the size of her fishing fleet so as to increase the catch instead of concentrating on the construction of fish-processing facilities and thus increase the value of the existing catch.

The Fisheries Institute chief conceded that this raises the problem of ever-increasing tariff restrictions of consumer nations placed on finished fish-food products which prevent Iceland from finding adequate markets and from competing with domestic production. Iceland has often asked those countries to help Iceland solve this problem and in turn Iceland will buy industrial products from those countries. Iceland also is becoming increasingly worried about the direct subsidies being paid by many countries to their fishing industries which fosters an "unnatural development" of fish marketing and hinders the natural development of fishing, such as in Iceland. Iceland's position among fishing nations will depend on the development of such trends in the future.

Other speakers at the conference included Sweden's Director of Fisheries who spoke on the Swedish Salmon Research Institute, and a representative from Denmark who spoke on international standardization of fish and fish products. (United States Embassy, Reykjavik, July 14, 1964.)

Note: See Commercial Fisheries Review, October 1962 p. 41; June 1962 p. 46.

## NORTH PACIFIC FISHERIES CONVENTION

## PARTIES TO THE CONVENTION WILL SEEK AGREEMENT AT MEETING IN OTTAWA, SEPTEMBER 9, 1964:

Talks began in Washington and continued in Tokyo last year for revision of the International Convention for the High Seas Fisheries of the North Pacific Ocean will reopen in Ottawa, Canada, September 9, 1964. The Parties to the Convention (Canada, Japan, and the United States) are seeking agreement on modification of the treaty under which the International North Pacific Fisheries Commission was established in 1953 and charged with developing recommendations for the conservation of the high-seas fisheries of the North Pacific.

The treaty had a guaranteed minimum life of 10 years and thereafter until 1 year from

### International (Contd.):

the date on which any member country should give notice of termination. No such notice has been given, but in 1963, at the request of Japan, two rounds of negotiations took place among the Contracting Parties. The first round was held in Washington in June and the second in Tokyo during September and October. Progress toward an agreement was made at those meetings but further negotiations are required. (Canadian Department of Fisheries, Ottawa, June 25, 1964.)

Note: See Commercial Fisheries Review, Feb. 1964 p. 64, Jan. 1964 p. 41, Dec. 1963 pp. 52 and 71.

### ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

#### FISHERIES COMMITTEE MEETS:

The Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) met at Paris, France, June 29-30, 1964. At the meeting, the Committee considered a Report on Subsidies and other financial support to the fishing industries of member countries. Other topics on the agenda were: (1) country notes on study of price systems, (2) a note on the influence of recent changes in custom duties for fish fillets, and (3) a progress report on the execution of the Committee's programs.

Note: See Commercial Fisheries Review, Aug. 1963 p. 76; May 1963 p. 54; Feb. 1963 p. 62.

### SHRIMP

#### INTERNATIONAL SHRIMP COUNCIL PLANNED TO PROMOTE SHRIMP CONSUMPTION:

A resolution authorizing the creation of an International Shrimp Council was adopted in May 1964 by the Board of Directors of the Shrimp Association of the Americas. Chas. E. Jackson, Fisheries Consultant of Washington, D.C., has been employed by the Association to direct the Council's development.

The new Council is intended to be a world-wide organization with a membership which will consist of the countries which produce shrimp. Its major objective will be the promotion and expansion of the shrimp market and the increased consumption of shrimp in the United States and elsewhere through advertising and publicity. Something similar to the international institute that was organized by the world-wide coffee producers several years ago is contemplated in the crea-

tion of the International Shrimp Council. (Shrimp Tales, Bulletin No. 294, Shrimp Association of the Americas.)

### WHALING

#### WHALE DISTRIBUTION IN NORTHEAST PACIFIC SHOWN ON SOVIET MAP:

A map showing the distribution of whales in the Northeast Pacific Ocean and the Bering Sea was on show at one of the sessions in Vladivostok, U.S.S.R., of the scientific council of the Pacific Fishing and Oceanography Research Institute. It sums up results of the North Pacific expedition of the Institute from 1958 to this year.

The map marks main areas of distribution of sperm, humpback, and finback whales, and also their summer and winter habitats. It shows the northern boundary of the distribution of sperm whales which has been determined for the first time.

The map is considered important for organizing rational whaling, and Soviet expeditions use it as an aid to safeguarding stocks and fulfilling international conventions restricting whaling. (The Fishing News, March 26, 1964.)



### Australia

#### TUNA FISHERY HAS GOOD SEASON:

Late in May 1964, South Australia's record-breaking tuna season was still going strong. Up to May 20 total landings at Port Lincoln were 6,059 short tons, pushing the Australian catch for 1963/64 (July-June) up to 8,974 tons. This was 3,475 tons more than in 1962/63, thus making tuna the leader in the Commonwealth's annual finfish catch.

A record single day's landing at Port Lincoln was 430 tons on February 22, 1964, which would have been greater had not a sudden storm resulted in 40 tons of tuna being lost overboard by the fleet of 20 vessels. (Australian Fisheries Newsletter, June 1964.)

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#### TUNA COULD TOP FISH CATCH:

Tuna appears certain to head the list in the Australian finfish catch by weight for fiscal year 1963/64. By April 24, the Australian tuna catch was a record 8,215 short tons, and



## Australia (Contd.):

had exceeded the 1962/63 year's total by 2,716 tons.

If past seasons' trends are maintained, it is estimated that the 1963/64 tuna catch will total 8,670 tons (17,340,000 lbs.). It will be worth an estimated £500,000 (US\$1.1 million) ex-vessel.

The New South Wales tuna season ended in January with a record catch of 2,915 short tons while in South Australia the total was a record 5,300 tons by April 24, 1964.

Except for 1956/57, when Australian salmon held top place, mullet has been the leader in the annual finfish catch by weight for the past 10 years, and production has remained steady at between 12.0 to 13.0 million pounds. The 1962/63 mullet catch was 13,734,696 lbs., worth an estimated £572,279 (US\$1.3 million) ex-vessel.

A total of 600 short tons of frozen whole bluefin tuna caught off the South Australia coast was exported to the west coast of the United States in March 1964. (Australian Fisheries Newsletter, May 1964.)

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DUTY ON SHRIMP IMPORTS:

A duty of 1s. (about 11 U.S. cents) a pound on imports of frozen shrimp and prawn, and prawn meat from both British preferential and most-favored nation sources came into force on April 24, 1964. Previous duty was 1d. (about 0.9 cent) a pound. Frozen shrimp and prawn of New Zealand origin will be subject to a duty of 4d. (about 3.6 cents) a pound.

Announcing the new tariff, the Minister representing the Minister for Customs and Excise said the protection afforded was approximately at the level enjoyed by the industry prior to the removal of the sales tax in August 1963.

Queensland Gold Coast trawlers reported locating king-size shrimp more than a foot long and up to half a pound each on a reef 14 miles offshore. (Australian Fisheries Newsletter, May 1964.)

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FISHERIES LANDINGS, 1962/63:

Australia's fish and shellfish landings of 153.8 million pounds in fiscal year 1962/63 (July 1-June 30) set another record, announced the Australian Minister for Primary Industry. Exports and imports of fishery products rose slightly, and home consumption was at 11 pounds per capita annually. The larger landings for the year were attributed to a 26-percent increase in shrimp landings, a spiny lobster catch that was 6 percent above the previous year, and a small increase in finfish landings.



In the past 8 years, Australia's fishery landings climbed steadily from 104 million pounds in fiscal year 1955/56 to where they reached the much larger amount in 1962/63--an increase of 48 percent. At the same time, Australia's per capita consumption of fishery products kept pace with the growing population and rose from 10 to 11 pounds annually.

The leading species in the 1962/63 finfish landings was mullet with 13.7 million pounds, followed by tuna with 11 million pounds (an increase of 400,000 pounds from the previous year). The increase in tuna landings was considered only moderate because of the relatively small tuna catch in New South Wales. In the past 8 years, however, Australia's tuna landings have increased by more than one million pounds.

Australia's shark catch is growing in importance having increased 17 percent from the previous year to 10.5 million pounds in 1962/63. Victoria was again the leading shark producer, although New South Wales and South Australia both increased their shark landings significantly.

### Australia (Contd.):

Australian salmon and barracouta landings dropped 32 percent and 29 percent, respectively, from the previous year.

The Minister said fishery products exports had increased in the past 8 years from 5.4 million pounds to 13.6 million pounds, or by more than 150 percent and imports had moved up from 52.5 million pounds to 64.3 million pounds, an increase of 23 percent.

Commenting on the fact that Australians are gradually increasing their per capita consumption of fishery products, he added, "Consumption in Australia is now the same as in the United States, but only half the United Kingdom figure and less than a quarter that of Japan. I feel sure, however, that as and when supplies of fish can be made more readily available to a wider domestic market--and in forms which are in demand--we shall see a further improvement in consumption. The steep rise in tuna consumption is proof of what can happen.

"In recent years, the Commonwealth Government has done a considerable amount to help the Australian fishing industry by way of surveys, the encouragement of new techniques, improved fisheries management, and research into the habits of important species. This work will continue." (The Fishing News, March 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 41.

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### TASMANIA SCALLOP SEASON EXTENDED:

On the recommendation of the Sea Fisheries Advisory Board, the 1964 Tasmanian scallop season on all beds opened on May 14, 1964. The ban on Sputnik (Baird) dredges remains, but night fishing will be allowed.

The Tasmanian Minister for Fisheries said that it was intended to leave the season open for as long as possible to encourage and maintain a stable industry. (Australian Fisheries Newsletter, May 1964.)



### Canada

#### NEW FISH-PROCESSING PLANT OPENS IN NOVA SCOTIA:

A new Canadian fish-processing plant, built at a cost of US\$8 million, was opened at Lunenburg, Nova Scotia, on June 24, 1964. The plant covers an area of 5½ acres. With an estimated production capacity of over 80 million pounds of fishery products and by-products a year, the plant will require more than 20 trawlers to keep it supplied with raw material. About 400 persons will be employed on shore, and nearly 500 more at sea.

The plant is capable of handling up to 50,000 pounds of fish an hour, and will have a maximum filleting rate of 35,000 to 45,000 pounds an hour. Smoked fish production capacity is 30,000 pounds in 12 hours, and fish meal production of 150 long tons each 24 hours.

The plant's cold-storage holding capacity is 6 million pounds and it can make 180 tons of ice a day. A wharf fish-holding room can accommodate 300,000 pounds of fish.

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#### NEW FISHERIES RESEARCH VESSEL PLANNED:

A 130-foot fisheries research vessel equipped with a number of unusual features is to be added to the Atlantic Coast research vessel fleet of the Fisheries Research Board of Canada, announced Canada's Fisheries Minister on July 3, 1964. This will aid Canada's Department of Fisheries in the national development program and in fulfilling its international commitments in fisheries conservation.

The Canadian Department of Transport has invited bids for a pelagic fisheries research vessel to be equipped for stern trawling and scallop dragging, with a range of 3,000 miles at a cruising speed of 11 knots. She will have a 27-foot beam, a draft of 10 feet 9 inches, and a complement of 21 (including scientific personnel and crew).

The vessel will be equipped with a passive antirolling "flume stabilization" system to provide a steady platform while in operation at sea, and a bow-thruster will be installed well below the low-water line for slow-speed maneuvering. The design is the first of its kind to have a "flume stabilization" sys-

Canada (Contd.):

tem, a bow water jet-thrust system, and the absence of bilge keels.

The vessel specifications call for all-welded construction with a steel hull strengthened for navigation in ice, and an aluminum deckhouse and wheelhouse amidships. An extended forecastle, raked stem, and reverse transom will enhance the appearance of the vessel. Provision is made for fish pounds and fishing equipment and gear to be located on the upper deck aft. One of the unusual features will be the installation of specially-designed hinged gallows for lowering and retrieving trawls. The propulsion machinery will be amidships.

The steering gear will be of the electro-hydraulic rotary vane type with emergency hand-hydraulic operation. An electro-hydraulic anchor windlass capable of a one-half-ton pull at 110 feet per minute will be fitted on the forward deck. Two hydraulic trawl winches, each capable of exerting a pull of 4 tons at 240 feet per minute will be fitted to operate in synchronization or independently as required. An oceanographic winch is to be fitted to permit the taking of samples which will be processed in the vessel's laboratories.

The most modern navigational aids available are to be installed and will include 2 radars, gyro-compass, automatic pilot, 3 echo-sounders, Loran, navigator, and radio-telephones. The propulsion machinery will consist of a nonreversing, two-stroke direct drive Diesel engine rated 600 b. hp. cont. at 310 r.p.m. and coupled to a four-bladed, controllable, pitch, stainless steel propeller. Electric power will be provided by 3 Diesel driven generators.

The vessel is expected to be put into service in the spring of 1966. (Canadian Department of Fisheries, Ottawa, July 3, 1964.)

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#### **SPANISH TRAWLER CONVICTED FOR VIOLATION OF TERRITORIAL WATERS:**

Two Spanish fishing trawlers were arrested by the Canadian Government at St. John's, Newfoundland, in October 1963, for fishing inside Canadian territorial waters at Trepassey Bay in southeastern Newfoundland. On July 15, 1964, one of those two trawlers was convicted by a St. John's Magistrate Court. The cap-

tain of the trawler Estornino was sentenced to one month in jail or \$200 fine for unlawfully fishing inside Canadian waters. Both trawlers had been arrested at the same time and place--45°35' N. latitude, 53°22'5" W. longitude, 6 miles from Cape Pine at the western tip of Trepassey Bay.

The St. John's Magistrate based his decision on these points: (1) Trepassey Bay is defined as a bay under international law; (2) the headland to headland rule for measuring territorial waters is applicable.

The outcome of the second case, involving the companion trawler Esturion also from Vigo, Spain, was expected to produce a similar conclusion.

The Court's ruling followed a 10-months postponement of both cases, with the vessels under \$1,000 bond each. Both cases were prosecuted by the Federal Department of Fisheries, and defended by an attorney hired by the local Spanish Vice Consul.

It was not known when the second court case was to be decided, or whether the adverse ruling would be appealed by the defendants or by the Spanish Government. (United States Consulate, St. John's Newfoundland, July 21, 1964.)

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#### **BOUNTY PAYMENTS ON PACIFIC HARBOR SEALS DISCONTINUED:**

The discontinuance of bounty payments on harbor seals on Canada's Pacific Coast became effective July 31, 1964, announced the Canadian Minister of Fisheries on July 17. As a means of control of the predatory harbor seal population, the Canadian Government has, for many years, paid a bounty of C\$5.00 on each proven kill.

The recent introduction of new processes in preservation and treatment of harbor seal skins has contributed to the development of markets for the skins, particularly in Europe. The demand has grown steadily and prime harbor seal skins have been bringing more than \$50.00 each on the local market.

The commercial production of harbor seals has now reached a point where population control by the bounty payment method no longer is necessary. The decision to cease bounty payments follows a careful study of

## Canada (Contd.):

all factors involved by personnel of the Department of Fisheries and scientists of the Fisheries Research Board of Canada. (Canadian Department of Fisheries, Vancouver, July 17, 1964.)



## Chile

TUNA FLEET TO BE EXPANDED:

Chile is planning to progressively expand her tuna fishing fleet, according to information received by the Japan Frozen Tuna Producers Association. Of the 3 Chilean fishing firms presently operating 4 tuna vessels from bases in that country, one firm is said to be planning on increasing its tuna fleet to a total of 10 vessels by the end of 1965. Many Chi-



lean "surrounding net" or purse-seine fishing vessels (170-180 gross tons in size), which are fishing for anchoveta, reportedly can be converted into tuna vessels. (Suisan Keizai Shimbun, July 11, 1964.)

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#### DEVELOPMENTS ON THE PROPOSED JAPANESE-CHILEAN KING CRAB VENTURE:

A Japanese fishing company, which plans to establish a joint king crab fishing venture with Chilean interests, is studying the results of the experimental crab operations conducted off the Chilean coast December 1963-April

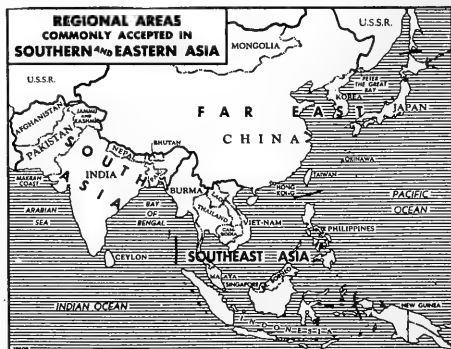
1964. Its findings so far indicate the need to conduct another series of exploratory operations before full-scale commercial operations can be started. Therefore, indications are that the proposed joint venture may not become an established commercial enterprise until the fall of 1965. (Suisan Tsushin, July 13, 1964.)



## Communist China

PURCHASE OF LARGE TRAWLERS PLANNED:

The Central Trust Corporation of Mainland (Communist) China planned to accept bids on September 4, 1964, for the construction of three 1,000-ton trawlers. The Corporation



plans to use the trawlers in the Yellow Sea fishery and hoped to purchase the vessels from Japan. (Suisancho Nippo, July 4, 1964.)



## Cuba

IMPORTS OF FISHERY PRODUCTS FROM JAPAN, JANUARY-APRIL 1964:

Japan exported 586 metric tons of frozen tuna and swordfish to Cuba during January-April 1964, with an f.o.b. value of US\$180,000 (65,276,000 yen). The principal product was 535 tons of yellowfin tuna with a value of \$166,000 (average of \$310 a ton), followed by 20 tons of albacore valued at \$6,500 (average \$325 a ton), 6 tons of unclassified tuna valued at \$1,700 (average \$238 a ton), and 25 tons of

## Cuba (Contd.):



swordfish (excluding broadbill) valued at \$6,000 (average of \$240 a ton). (Customs Division of Japanese Ministry of Finance.)



## Denmark

## FISHERIES TRENDS, FIRST QUARTER 1964:

**Landings:** Danish fisheries landings in home ports during January-March 1964 were about 9 percent below those in the same period of 1963 due to a sharp drop in landings of industrial fish which more than offset increased landings of most food fish items. On the other hand, foreign vessels increased their landings in Danish ports in early 1964. (Danish imports of fishery products consist mostly of fresh fish, mainly herring, landed by Swedish fishing craft in the Danish ports of Skagen and Hirtshals.) The limited landings of Danish vessels in foreign ports (mainly England) consisted mostly of cod.

Table 1 - Danish Fisheries Landings, January-March 1963 and 1964

Species	Jan.-Mar.	
	1/1964	1963
	(Metric Tons).	
Landings in Denmark by Danish vessels:		
Flatfish	13,145	7,833
Cod	25,766	20,412
Herring	69,436	54,709
Brisling	1,868	1,419
Mackerel	215	191
Eels	26	49
Pond trout	1,835	1,570
Other fish <sup>2/</sup>	19,885	66,202
Mussels	4,657	578
Starfish	1,466	10
Shrimp, lobsters, & other shellfish	1,104	800
Total	139,403	153,773
Landings in Denmark by foreign vessels.	50,374	41,240
Danish landings in foreign ports of United Kingdom, Sweden, and the Netherlands.	688	290

<sup>1/</sup>Preliminary.

<sup>2/</sup>Mostly industrial fish.

Source: Danish Ministry of Fisheries.

**Processing:** Danish production of processed fishery products in January-March 1964 was reported by the Danish Ministry of Fisheries as follows:

**Canned products:** 1,395 metric tons of herring and sprats, 74 tons of mackerel, 184 tons of mussels, 175 tons of other shellfish, and 1,960 tons of other fish products.

**Semipreserved products:** 1,225 tons of herring and sprats, 103 tons of other fish products, and 108 tons of mussels.

**Fresh and frozen fillets:** 7,281 tons of cod, 292 tons of "cod-like" (haddock, coalfish, hake, ling, etc.) fish, 2,738 tons of plaice, 254 tons of other flatfish, 10,175 tons of herring, and 35 tons of other fish.

**Smoked products:** 229 tons of herring and sprats, 114 tons of mackerel, 169 tons of eels, 105 tons of salmon and trout, and 62 tons of other fish.

**Industrial products:** 14,511 tons of fish meal, 5,316 tons of fish oil, 1,405 tons of fish solubles, and 1,214 tons of ensilage (chemically treated raw fish).

**Miscellaneous products:** 391 tons of "force meat" (ground fish mixed with milk and flour) and 280 tons of other miscellaneous fishery products.



Fig. 1 - Fishing cutter docked at Kalundborg, one of the smaller Danish fishing ports.



Fig. 2 - Plaice hung out for drying--dried plaice is a specialty known all over Jutland.

## Denmark (Contd.):

**Exports--General:** Danish exports of fishery products in the first quarter of 1964 were down about 2 percent in quantity but up 12 percent in value from those in the same period of 1963. Higher prices for fresh and frozen fishery products accounted for the gain in value in spite of declining shipments. (Exports of fresh fishery products were down 8 percent in quantity, but up 11 percent in value.)

In January-March 1964, shipments to the European Economic Community accounted for about 46 percent of the value of Danish fishery exports, shipments to the European Free Trade Association accounted for 39 percent, shipments to the Communist Bloc countries accounted for 4 percent, and shipments to other countries accounted for the remaining 11 percent. West Germany was the leading buyer of Danish fishery products in the first quarter of 1964 with receipts valued at Kr. 47.2 million (US\$6.8 million), followed by the United Kingdom with receipts valued at Kr. 23.5 million (\$3.4 million), Sweden with Kr. 21.0 million (\$3.0 million), Italy with Kr. 11.3 million (\$1.6 million), Switzerland with Kr. 10.7 million (\$1.5 million), France with Kr. 6.9 million (\$1.0 million), and the United States with Kr. 6.8 million (\$1.0 million).

Table 2 - Danish Exports of Fishery Products,  
Jan.-March 1963 and 1964

Product	January-March			
	1964		1963	
	Qty.	Value	Qty.	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
<b>To all countries:</b>				
Fresh products . . . . .	53,829	12,323	58,500	11,138
Frozen products . . . . .	12,435	5,864	11,600	4,808
Processed fishery products . . . . .	3,998	2,713	5,100	2,911
Fish meal & solubles <sup>2/</sup> . . . . .	12,762	1,673	9,300	1,246
Total exports to all countries . . . . .	83,024	22,573	84,500	20,103
<b>To the United States:</b>				
<b>Fresh &amp; frozen products:</b>				
Fillets:				
Cod . . . . .	1,016	458	1,884	869
Other fillets . . . . .	36	23	111	63
Pond trout . . . . .	104	117	313	362
Norway lobster . . . . .	65	177	24	76
Others . . . . .	29	23	14	11
Cured prod. (smkd. & salted) . . . . .	9	6	15	5
<b>Canned products:</b>				
Herring & sprat . . . . .	161	106	176	134
Shrimp . . . . .	41	57	3/	3/
Others . . . . .	19	15	47	47
Semipreserved products . . . . .	4	7	2	4
Fish solubles . . . . .	-	-	-	-

<sup>1/</sup> Preliminary.

<sup>2/</sup> Does not include marine oils.

<sup>3/</sup> Included in "other canned products" classification.

<sup>4/</sup> Includes canned shrimp.

Note: Values reported in Danish kroner and converted to U. S. dollars. Data for 1964 were converted at rate of Kr. 6,908 equals US\$1.00; data for 1963 were converted at rate of Kr. 6,906 equals US\$1.00.

**Exports to the United States:** Danish shipments of fishery products to the United States in the first quarter of 1964 were down 43 percent in quantity and 38 percent in value from those in the same period of 1963. Declines were especially large in items which have a good European market (such as pond trout). Shipments of cod fillets in the form of blocks decreased because of an early lack of interest by United States importers. Later, a renewed United States demand could not be met because stocks had been committed to British and Continental buyers. Norway lobster shipments are becoming more significant.

On June 17 and 18, 1964, the Danish Fisheries Minister initiated a campaign in New York City to sell more fish from

Denmark and Greenland in the United States. Luncheons were held for importers and food editors at the Danish Pavilion at the World's Fair. Denmark expects to continue the drive for greater sales of fishery products in the United States, (United States Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 24, 1964.)

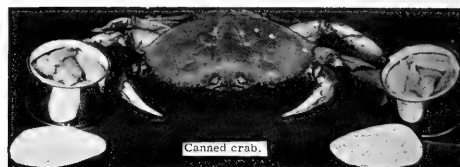
Note: See *Commercial Fisheries Review*, July 1963 p. 73.

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## IMPORTS OF FISHERY PRODUCTS, 1962-63 AND EARLY 1964:

Danish imports of fishery products consist mostly of fresh fish (mainly herring) landed by Swedish fishing craft in the Danish ports of Skagen and Hirtshals. Much of the herring is filleted and reexported, especially to West Germany.

Canned fishery imports consist mainly of sardines from Portugal; salmon from Japan, Canada, and Alaska; tuna from Peru, Yugoslavia, and Malaysia; shrimp from Sweden; crabs from the United States and the U.S.S.R.; and lobster meat from Canada.



Fish meal is imported mainly from Iceland and Norway, and fish oil from Peru and the United States.

The value of edible fishery products imported by Denmark from all countries during January-April 1964 totaled 44.9 million kroner (US\$6.5 million), an increase of 18 percent as compared with the same period in 1963. Danish imports of edible fishery products from the United States for the similar period were valued at 1.5 million kroner (\$213,000), up 83 percent from the same period in 1963.

**Imports From United States--1963:** Danish imports of fishery products from the United States in 1963 totaled 1,524 metric tons valued at US\$618,400. The value was more than double that of 1962. In that year, imports were largely canned fish and did not include any industrial fishery products. Canned fish and industrial products accounted for about 90 percent of the total value of the 1963 imports.

Denmark's fishery products imports from the United States are diversified and are not generally significant except for fish oil, frozen and canned crab meat, canned shrimp, and

## Denmark (Contd.):

Table 1 - Danish Imports of Fishery Products from the United States, 1962-1963

Product	1963			1962		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	Kr. 1,000	US\$1,000	1,000 Lbs.	Kr. 1,000	US\$1,000
<b>Fresh and frozen:</b>						
Salmon, fresh or chilled	21.2	83.6	12.1	1/	1.0	0.1
Salmon, frozen	32.8	142.7	20.7	-	-	-
Crab meat	28.4	191.4	27.7	19.0	133.0	19.3
Mussels	1.0	3.7	0.5	2.6	7.0	1.0
Other molluscs	2.0	7.4	1.1	-	-	-
Other	3.3	43.2	6.3	0.7	25.2	3.7
<b>Total fresh and frozen</b>	<b>88.7</b>	<b>472.0</b>	<b>68.4</b>	<b>22.3</b>	<b>166.2</b>	<b>24.1</b>
<b>Canned:</b>						
Salmon	47.7	144.3	20.9	26.9	107.0	15.5
Tuna	5.5	22.3	3.2	2.9	12.0	1.7
Shrimp	53.1	216.2	31.3	1/	0.2	1/
Crab meat	256.4	1,962.8	284.6	233.7	1,598.0	231.7
Lobster meat	2.3	34.7	5.0	2.0	23.0	3.3
Other	3.4	4.2	0.6	2.4	4.0	0.6
<b>Total canned</b>	<b>368.4</b>	<b>2,384.5</b>	<b>345.6</b>	<b>267.9</b>	<b>1,744.2</b>	<b>252.8</b>
<b>Salted:</b>						
Salmon	-	-	-	5.1	23.0	3.3
<b>Semipreserved:</b>						
Caviar, etc.	2.0	7.7	1.1	-	-	-
<b>Industrial products:</b>						
Fish oil, raw	2,693.7	1,160.9	168.3	-	-	-
Fish meal, etc.	206.2	238.7	34.6	-	-	-
Fish glue	0.7	2.8	0.4	0.7	2.0	0.3
<b>Total industrial products</b>	<b>2,900.6</b>	<b>1,402.4</b>	<b>203.3</b>	<b>0.7</b>	<b>2.0</b>	<b>0.3</b>
<b>Grand total</b>	<b>3,359.7</b>	<b>4,266.6</b>	<b>618.4</b>	<b>296.0</b>	<b>1,935.4</b>	<b>280.5</b>

1/Less than 100 kilos and \$100.

Note: One kroner equals US\$0.145.

frozen and canned salmon. A potential market may exist in Denmark for frozen bluefin tuna from the New England fishery. Danish canners this past summer bought Japanese yellowfin or big-eyed tuna (headed and gutted)

from Italy at about \$400 a ton delivered Skagen. Frozen tuna from New England might be shipped to Denmark on the small refrigerator vessels which transport cod blocks to Gloucester, Mass. There is also some interest in Denmark

Table 2 - Danish Imports of Fishery Products by Commodities, 1961-1963

Table 2 - Danish Imports of Fishery Products by Commodities, 1961-1963									
Commodity	QUANTITY			VALUE					
	1963	1962	1961	1963	1962	1961	1963	1962	1961
	. . . . (Metric Tons) . . . .			. . . . (Kr. 1,000) . . . .			. . . . (US\$1,000) . . . .		
<b>Fresh:</b>									
Fish and roe . . . . .	132,432	103,723	57,675	98,151	102,771	49,320	14,232	14,902	7,151
Crustacea, squid, and octopus . . . . .	555	391	424	3,372	2,836	2,134	489	411	309
Mussels . . . . .	33	121	74	445	525	225	65	76	33
<b>Salted:</b>									
Herring, spiced . . . . .	4,511	3,767	4,074	9,124	7,379	7,022	1,323	1,070	1,018
Cod, wet and dry . . . . .	1,530	498	863	4,194	1,219	2,466	608	176	358
<b>Smoked . . . . .</b>	<b>113</b>	<b>126</b>	<b>156</b>	<b>318</b>	<b>336</b>	<b>474</b>	<b>46</b>	<b>49</b>	<b>69</b>
Canned . . . . .	1,479	1,331	1,247	11,126	9,173	7,759	1,613	1,330	1,125
Mussels, processed . . . . .	32	26	29	280	151	151	41	22	22
<b>Industrial:</b>									
Fish meal . . . . .	12,309	15,520	27,759	11,914	16,613	24,857	1,728	2,409	3,604
Herring oil, etc. . . . .	2,545	1,861	924	2,399	1,505	990	348	218	144
Medicinal oil . . . . .	2,557	2,439	1,926	3,837	3,218	3,000	556	467	435
Other fish oil . . . . .	19,032	17,738	20,379	12,212	14,213	21,606	1,771	2,061	3,133
Fish glue . . . . .	12	17	8	38	54	32	5	8	5
<b>Others . . . . .</b>	<b>25,745</b>	<b>15,986</b>	<b>10,805</b>	<b>10,344</b>	<b>6,818</b>	<b>3,883</b>	<b>1,500</b>	<b>988</b>	<b>563</b>
<b>Grand total . . . . .</b>	<b>202,885</b>	<b>163,544</b>	<b>126,343</b>	<b>167,754</b>	<b>166,811</b>	<b>123,919</b>	<b>24,325</b>	<b>24,187</b>	<b>17,969</b>
Note: Products originating in Greenland and the Faroe Islands not included. Seaweed and agar not included.									

Note: Products originating in Greenland and the Faroe Islands not included. Seaweed and agar not included.





## Ecuador (Contd.):



General view of the port of Manta, Ecuador.

from Ecuadorian fishermen for shipment to Puerto Rico aboard the company's 700-ton freezer ship *Western King*. For its part, the Puerto Rican company has pledged to make US\$32,000 available for Ecuadorian fishing cooperatives and to construct a land-based freezing plant in Ecuador within 5 years. The firm has already financed the construction of at least 5 small bait boats to help guarantee supply. The Puerto Rican firm pays fishermen about \$65 a ton for tuna. Ecuadorian Government charges for a license and matrícula increase the Puerto Rican company's tuna buying costs by an additional \$5 a ton. A Government Decree relieved the company from payment of export taxes.

Several other companies have been incorporated to fish for tuna off Ecuador but no actual investment has yet been made.

A clash between foreign tuna fishermen and the Government of Ecuador occurred in mid-1963 over Ecuadorian claims to extensive territorial waters and Ecuadorian licensing procedures. Foreign-flag fishing vessels have been required to purchase an Ecuadorian matrícula and license before entering Ecuadorian fishing waters. (United States Consulate, Guayaquil, May 5, 1964.)

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**SHRIMP INDUSTRY TRENDS, 1963:**

Exports of frozen shrimp from Ecuador in 1963 amounted to 2,583 metric tons valued at US\$1.7 million as compared to shrimp exports in 1962 of 2,330 tons valued at \$3.0 million, according to preliminary data. The sharp drop in the value of the shrimp exports in 1963 was due to declining prices in the United States which absorbed 99 percent of Ecuador's shrimp exports. The only other buyer in 1963 was Japan which took about 16 tons. The export market is the most important factor in the Ecuadorian shrimp industry. In 1962, production of fresh and frozen shrimp in Ecuador amounted to 3,200 tons, but only 870 tons of that supply was consumed locally.

Shrimp freezing and processing in Ecuador are done by 7 firms, most of which are located in the Guayaquil area. The largest firm can process 80 tons of shrimp a month. Total direct shrimp industry employment is about 3,000 persons. In spite of the United States price decline, all the firms processing shrimp for export seem to have survived.

No major investments were made in the shrimp industry during 1963. A fleet of 150 shrimp vessels, most of which work in the Gulf of Guayaquil, has overcrowded the prime fishing grounds for the white, striped, and brown shrimp found near the surface. According to the Ecuadorian National Fishing Institute, between 70-80 percent of the catch is white shrimp (*Penaeus occidentalis*). Some of the shrimp vessels have moved up the coast to ports such as Manta. In 1963, the gross registered tonnage of the Ecuadorian shrimp fleet totaled 7,150 metric tons. Inadequate refrigeration equipment and underpowered winches keep the fleet from seeking red shrimp off the coast in deeper water. However, red shrimp explorations will be conducted by the Ecuadorian National Fishing Institute research vessel *Huayaipae*. The 73-foot vessel underwent its final sea trials late in February 1964, and began its first research trip, to the Galapagos, shortly thereafter.

The *Huayaipae* will also be used to chart the little understood changes which occur when the major ocean currents (which bathe the continent and the Galapagos periodically) change

## Ecuador (Contd.):

course. The vessel is participating in an international effort, involving operations in Chile, Panama, and Costa Rica, which is scheduled to last until 1966. The Fishing Institute hopes to develop information which will be useful in charting the migratory patterns of fish. (United States Consulate, Guayaquil, May 5, 1964.)

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### SPINY LOBSTER INDUSTRY TRENDS, 1963:

Spiny lobster exports from Ecuador have shown a consistent and rapid rise (from 33 metric tons valued at US\$47,000 in 1961 to an estimated 123 tons valued at \$185,000 in 1963), although both in quantity and dollar value they continue to lag far behind shrimp and tuna exports. In 1963, spiny lobsters accounted for about 5 percent of Ecuadoran fishery exports by value. The total 1963 spiny lobster catch in Ecuador has been estimated at about 500 tons (landed weight).

Ecuadoran spiny lobsters are caught off the Santa Elena Peninsula and the Galapagos Islands. Fishing is done by net or by primitive hand methods. Satisfactory lobster traps for Ecuadoran waters have not yet been devised. Fishermen receive between \$0.30 and \$0.50 for each lobster, depending upon its size. On the Galapagos the going price is \$0.40. Several persons have said that the Santa Elena area has been damaged by overfishing.

Ecuador's "mechanized" lobster fleet, including fishing and freezer vessels, consists of 6 vessels totaling 542 gross registered tons.

Most of the spiny lobster catch is exported as frozen lobster tails. Freezing and packing generally take place in local shrimp plants. A small freezing plant in the Galapagos processes up to 3 tons a month of spiny lobster tails. At least one exporter ships live spiny lobsters to Peru. Live spiny lobster shipments totaled 5 metric tons in 1963. (United States Consulate, Guayaquil, May 5, 1964.)

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### BOTTOMFISH INDUSTRY DEVELOPMENT:

Domestic landings of bottomfish in Ecuador are estimated at about 25,000 metric tons

a year with a value of about US\$4 million. Fishing for bottomfish is still done mainly by small boats and canoes which fish a few miles offshore with hand lines. An almost complete absence of shore facilities in the past has hampered distribution along the coast and hampered the marketing of bottomfish in the mountainous interior of Ecuador.

With the aid of the Ecuadoran Government the local industry is beginning to attract investment which will help provide needed processing facilities. A freezing plant constructed and organized with the aid of the Ecuadoran Ministry of Development has begun marketing frozen bottomfish through distribution centers in Quito and Ambato. Domestic consumption of frozen bottomfish now averages about 7,000 pounds a week and should increase rapidly. The freezing plant can store 80 tons of frozen bottomfish. Fish are supplied by local fishermen organized into a cooperative. A 17- to 18-ounce plastic package of white fish retails in Ecuador at 4.60 sucres (approximately 25 U. S. cents).

Trucks without special refrigeration equipment carry loads of frozen fish to Quito. Reportedly, there is little deterioration during the 10-hour trip. The distribution system is to be expanded to other cities in the mountains during 1964, and eventually the Government plans to finance freezing cooperatives in several other coastal villages.

A group of Ecuadoran and United States businessmen plan to invest about \$280,000 in a company located at Manglaralto, Ecuador, which will construct facilities to prepare frozen bottomfish fillets for export to the United States. Later the company may expand to process canned tuna and frozen shrimp. The company plans to conduct a feasibility study to determine the extent of the white fish stocks and to examine the industrial problems involved in the project. (United States Consulate, Guayaquil, May 5, 1964.)



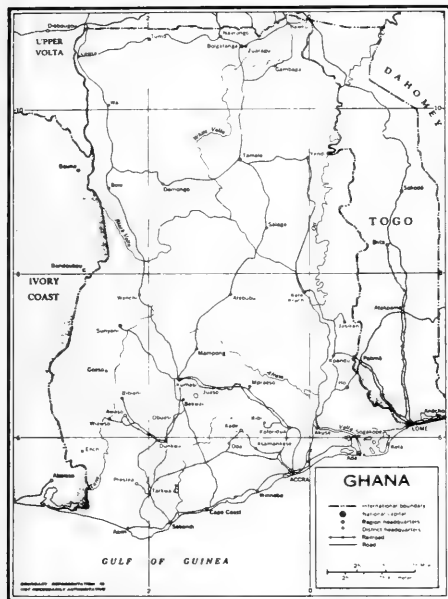
### **Ghana**

#### GOVERNMENT CONTROL OF TWO PRIVATE FISHING FIRMS:

Two private fishing companies in Ghana announced in April 1964, a reorganization of their activities which results in placing them under substantial Government control. The

## Ghana (Contd.):

actions stem from a Government announcement in late 1963 that all fishing activities in Ghana were to be consolidated into one of three sectors--State, cooperative, and small "peasant" fishermen.



One of the two private Ghanaian-owned fishing companies has sold 40 percent of its shares to the Ghana Government. Twenty-five percent of the remaining shares are to be held in trust for the workers of the company; 10 percent of the shares are to be held in trust for the people of Mankoadze village in the central region of Ghana. A new board of directors is to be appointed by the Government. The other private firm, formerly owned by Ghanaians, began to trade on March 31 under a different name in line with the Government's consolidation plans.

It was reported that the changes brought about by the reorganizations appear to represent a loss of control by private ownership. (United States Embassy, Accra, April 15, 1964.)



## Iceland

HERRING FISHERIES TRENDS  
AS OF JULY 13, 1964:

Iceland's summer herring catch as of July 13, 1964, was about 153,057 metric tons, an increase of 135 percent compared with the catch of 65,392 tons in the same period of 1963. If fishing were to continue good until the end of the season (about mid-September), the summer herring catch will be considerably better than last season.

The main summer herring fishing grounds are along the northeast and east coasts of Iceland (from Glettingarnes-grunni to Gerpisflaki). Unloading facilities at those ports are not adequate to handle the seasonal peak loads and the fishing vessels either have to wait their turn or take the herring to more distant ports. Some transport ships are taking herring from the fishing vessels for transport from the east coast to less congested harbors on the north coast. Herring factories now pay 3 kronur or 7 U.S. cents per mal (about 330 pounds) into a special fund used to compensate boats for transporting herring for unloading in less congested harbors. When a harbor in a congested area is "closed," the transport to herring factories in less congested harbors brings the seller a higher price--about 37 cents more per mal. Part of this higher price (about 23 cents) is paid out of the special fund and the balance of the extra amount is paid by the buying factory.

The prices of herring meal and oil are much better than last year (1963). The main buyers are, as formerly, the United Kingdom, Norway, the Netherlands, West Germany, and Sweden. A considerable amount of herring oil has been sold ahead at \$70 (US\$196) a metric ton compared with \$45 (\$126) last year. Market conditions also are better for herring meal for which presales have been made at between 15 shillings 9 pence (\$2.20) and 16 shillings 6 pence (\$2.31) per protein unit. The 1963 prices ranged from 14 shillings to 14 shillings 6 pence (\$1.96-2.03) a protein unit.

Advance sales of Icelandic salted herring by country as of July 13, 1964, were estimated as: Sweden 213,000 barrels; Finland 60,000; United States 22,000; Denmark 13,000; Norway 11,000; and West Germany 10,000; for a total of 329,000 barrels of about 220 pounds each.

The Soviet Union had not yet agreed to pay the prices which the Icelandic negotiators claim are the prices paid by other buyers of their herring, and the negotiations were being continued in Reykjavik. Government officials concerned with the negotiations, however, indicated they expected an agreement would be reached at existing world market prices. The current protocol between Iceland and the U.S.S.R. specifies a maximum quantity of 15,000 metric tons of salted herring.

Iceland's Catch and Utilization of Summer Herring as of July 13, 1964		
How Utilized	1963	1962
	(Metric Tons)	
Salting . . . . .	4,128	15,056
Freezing . . . . .	2,025	1,658
Reduction (meal & oil) . . . . .	146,904	48,678
Total . . . . .	153,057	65,392

This year salting was begun late in the season partly because advance sales were delayed for price agreement and because the fat content of the herring, while high enough, was not firm enough for salting and such herring had to be used for reduction. (Herring is only sent to salting in quantities covered by advance sales.) Those factors, in addition to the greatly increased catch, account for the much larger quantity used for reduction during the first part of the 1964 season than in the same period of 1963. (United States Embassy, Reykjavik, July 15, 1964.)

Note: Values converted at rate of 1 Kr. 43.06 equal US\$1; 1 mal equals 150 kilos; barrel of salted herring 220 pounds; barrel of herring for salting 135 kilos; barrel of herring for freezing 120 kilos; barrel of herring for reduction 150 kilos.

\* \* \* \* \*

## Iceland (Contd.):

EXPORTS OF FISHERY PRODUCTS,  
JANUARY-MARCH 1964:

During January-March 1964, there was a considerable increase in exports of frozen fish fillets, fish meal, and herring meal as compared with the same period in 1963, ac-



Fig. 2 - Fish-processing plant in Iceland.

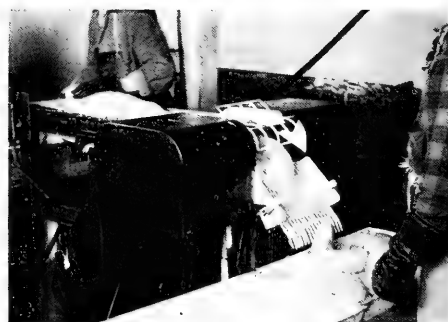


Fig. 3 - Cod fillets are skinned by machine.

Icelandic Fishery Exports, January-March 1964 with Comparisons						
Product	Jan.-Mar. 1964			Jan.-Mar. 1963		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 kr.	US\$ 1,000	Metric Tons	1,000 kr.	US\$ 1,000
Salted fish, dried	535	13,714	318	1,084	21,649	502
Salted fish, uncured	2,067	32,876	765	2,003	26,252	609
Salted fish fillets	463	6,703	156	293	4,313	100
Wings, salted	219	2,937	68	100	1,215	28
Stockfish	2,390	66,820	1,597	2,258	60,553	1,405
Herring on ice	19	140	3	6,608	21,880	508
Other fish on ice	10,303	58,710	1,362	11,598	56,980	1,322
Herring, frozen	7,721	45,987	1,067	14,556	77,953	1,869
Other frozen fish, whole	782	9,773	204	1,077	13,382	310
Frozen fish fillets	11,832	252,282	5,853	9,797	190,934	4,430
Shrimp and lobster, frozen	165	16,022	372	124	12,040	279
Roos, frozen	316	5,831	158	123	2,383	55
Canned fish	45	2,235	52	93	5,716	133
Cod-liver oil	1,351	12,536	291	1,917	14,213	330
Lumpfish roes, salted	3	81	2	24	335	8
Other roes for food, salted	981	15,195	353	1,005	14,077	327
Roos for bait, salted	-	-	-	-	-	-
Herring oil	13,905	138,314	3,209	14,180	135,257	3,138
Herring oil	4,807	38,233	887	11,044	42,276	981
Ocean perch oil	28	188	4	64	207	5
Whale oil	2,101	18,675	433	985	3,658	85
Fish meal	5,486	29,429	683	2,344	14,515	337
Herring meal	26,564	149,237	3,462	20,970	130,084	3,018
Ocean perch meal	109	621	14	-	-	-
Wastes of fish, frozen	257	1,081	25	347	1,072	25
Liver meal	143	943	22	130	908	21
Lobster and shrimp meal	87	346	8	-	-	-
Whale meal	630	3,514	82	-	-	-
Whale meat, frozen	49	378	9	6	46	1

Notes: Values converted at rate of 1 Danish crown 2.32 U.S. cents.

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.



Fig. 1 - Fishing vessels alongside the main fishing pier in the Westman Islands (off southwest coast of Iceland).

cording to the Statistical Bureau of Iceland's Statistical Bulletin, May 1964. Exports of herring on ice, frozen herring, and herring oil showed a considerable decrease in the first 3 months of 1964.

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HERRING PRICES, JUNE 16-  
SEPTEMBER 30, 1964:

The Icelandic State Fisheries Pricing Board has announced prices to be paid for south and west coast and north and east coast herring from June 16 to September 30, 1964. Prices are based on the quantity going into production. 1/

	I.Kr. Kilo	US¢ Lb.
<b>South and West Coast Herring</b>		
<b>(from Hornafjörður west to Rit):</b>		
Herring for salting	1.42	1.50
Iced herring for export 2/	1.40	1.18
Herring for filleting (pickling, freezing or salting) 2/	1.12	1.48
Herring fodder	1.00	1.05
Frozen herring, 10 percent minimum fat content (3-6 herring per kilo) 1/	1.60	1.69
<b>Herring for reduction:</b>		
Less than 12 percent fat content	0.81	0.85
More than 12 percent fat content	3/1.12	1.18

1/Quantity going into production is the weighed herring less quantity going into reduction. Sellers receive lower prices for that quantity going into reduction.  
2/Weighted quantity.  
3/Seller delivers herring to factory for I.Kr. 0.03 per kg.

Prices for June 16-September 30, 1964, are the same as those paid March 1-June 15, 1964, except that herring for reduction has been separated into 2 types. (United States Embassy, Reykjavik, July 7, 1964.)

## Iceland (Contd.):

	I.Kr.	US\$/bbl.
<b>North and East Coast Herring</b> (from Rit north to Hornafjörður): For each "mal" or barrel (150 liters or 298 lbs.) for salting or reduction (Price is based on delivery into the factory's loading equipment or in loading equipment on special herring transport ships) 1/	182	4.23
Each measured barrel (120 liters or 32 gals.) for salting as unloaded from boats 2/	230	5.34
Each salted barrel (with three layers around) (average weight 135 kgs. or 298 lbs.) 2/	313	7.27
Herring for freezing (barrel containing 120 liters or 32 gals.)	230	5.34

1/In addition, the State Herring Factories pay 1 Kr. 3.00 per "mal" into a special fund used to compensate boats for unloading herring in distant harbors when main harbors cannot accept the herring owing to full capacity.  
2/Price is based on delivery into salting boxes.

\*\*\*\*\*

## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-FEBRUARY 1964:

Species	January		January-February	
	1964	1963	1964	1963
	(Metric Tons)			
Cod	11,074	9,546	31,077	23,773
Haddock	5,618	7,545	10,615	12,265
Saithe	533	843	2,656	1,410
Ling	789	1,098	1,834	2,185
Wolfish (catfish)	202	251	842	948
Cusk	930	1,387	1,968	3,030
Ocean perch	646	511	1,920	1,668
Halibut	101	124	197	235
Herring	30,313	48,176	64,139	61,818
Shrimp	20	73	20	131
Capelin	-	-	3,716	-
Other	466	328	893	594
Total	50,692	69,882	119,877	108,057

Note: Except for herring which are landed round, all fish are drawn weight.

\*\*\*\*\*

## UTILIZATION OF FISHERY LANDINGS, JANUARY-FEBRUARY 1964:

How Utilized	January		January-February	
	1964	1963	1964	1963
	(Metric Tons)			
<b>Herring 1/ for:</b>				
Oil and meal	24,376	31,220	51,542	43,720
Freezing	4,828	8,406	9,366	8,697
Salting	1,109	4,396	3,231	4,497
Fresh on ice	-	4,154	-	4,904
<b>Groundfish 2/ for:</b>				
Fresh on ice	3,687	3,832	7,594	7,177
Freezing and filleting	10,030	10,604	25,583	23,493
Salting	3,608	3,107	11,002	7,341
Stockfish (dried unsalted)	1,807	2,502	5,215	5,333
Home consumption	992	1,365	2,079	2,350
Oil and meal	235	223	529	413
<b>Capelin for:</b>				
Freezing	-	-	133	-
Oil and meal	-	-	3,583	-

(Table continued on next column)

How Utilized	January		January-February	
	1964	1963	1964	1963
	(Metric Tons)			
<b>Shrimp for:</b>				
Freezing	20	64	20	113
Canning	-	9	-	19
Total production	50,692	69,882	119,877	108,057

1/Whole fish.  
2/Drawn fish.  
Source: Aegir, May 1 and 15, 1964.



## Ireland

## FISHING INDUSTRY SURVEYED BY UNITED STATES FISHERY SCIENTISTS:

A survey of the Irish fishing industry was made during April-June 1964, by a team of fishery scientists from the U.S. Bureau of Commercial Fisheries. An independent appraisal of the fishing industry in that country was requested by the Government of Ireland in order to determine its potential for future growth. A draft report prepared by the Bureau's scientists was submitted to the Prime Minister of Ireland.



The Bureau's team members reported that excellent cooperation was received in the conduct of their survey and are optimistic about the future development and expansion of the

## Ireland (Contd.):

Irish commercial fishing industry. Ireland has a relatively young industry. Most of the fishing vessels are less than 65 feet long, and the fishermen usually make trips of only one day. Larger vessels would increase production efficiency and stimulate trip fishing. Ireland's domestic markets are limited because of the relatively small population of 2.8 million people, but they can be expanded considerably by development of new products, introduction of improved marketing practices, and market promotion. In the past two years, the sales of newly introduced fishery products such as "fish fingers" (fish sticks) have tripled in the Irish market.

The team felt that shellfish production, catching, and processing methods could be improved so that Ireland could produce more fishery products for export to markets on the European continent, and that a fish-processing industry could be established to provide processed fishery products for domestic and foreign markets. One of the major recommendations made by the United States team was the establishment of a complete quality program that would provide for grading into sizes on the vessel and inspection of fish during all phases of the marketing chain.

Note: See Commercial Fisheries Review, May 1964 p. 46.

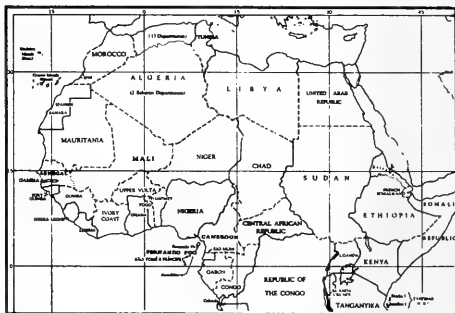


## Ivory Coast

NEW DEVELOPMENT IN  
SARDINE FISHERY:

A new development in the sardine fishery of the Ivory Coast was indicated with the arrival on July 7, 1964, of the purse seiner Cap Lopez with a full load of 130 tons of sardines. This 107-foot (550 hp.) vessel built in La Rochelle, France, in 1958, was rigged for purse seining and is equipped with a ring net of 750 meters (about 810 yards) in length, 65 meters (about 70 yards) in depth, with mesh of a stretched length of 28 millimeters (about 1.1 inches). She is the first vessel in this fishery to be equipped with brine-cooling facilities, and this maiden voyage was in the nature of an experiment to determine the feasibility of that method of holding fish for a considerable number of days. Due to seasonal movements of the Gulf of Guinea sardine, it was necessary to go as far as the waters off Dakar, Senegal, for this catch, a

distance of some 5 days. The fish were in brine a matter of 7 to 12 days on this trip, and the results were considered excellent. A negligible number of fish were bruised or chafed, but for all practical purposes the entire catch was in good condition and readily marketable.



The catch was sold by the 40-kilogram box (about 88 pounds) to eager "mammy" buyers for distribution in the Abidjan area, for drying and smoking by the many small fish-smoking houses in the area, and for overnight truck distribution to a distance of about 200 miles in the country's interior. Due to the relative scarcity of sardines at this season, the fish sold at wholesale for 2,500 CFA francs (about US\$10) a box. It was estimated there were between 3,000 and 3,500 boxes, for a gross value of some 7 million CFA francs (about \$28,000). This is a top price, however, and with the entry of more vessels into the fishery it is expected that a more normal price will be about 1,200 CFA francs (about \$4.80) a box. The price has been known to drop to 800 CFA francs (about \$3.20) a box during glut periods.

Improvements planned by the owners of the Cap Lopez, a Franco-Ivoirien company, include the installation of a power block (which will permit reduction of the vessel crew from its present 4 Europeans and 17 Africans to 4 Europeans and 10 Africans), and use of a fish pump for loading and unloading the vessel.

Fishing circles in the Ivory Coast are enthusiastic about the success of this venture--both the results obtained by the use of an off-shore purse seiner in the sardine fishery, and the success of the brine-cooling method of holding the fish over a relatively long period of time. It is expected that additional vessels

## Ivory Coast (Contd.):

similarly rigged will follow shortly. (Fisheries Attache, United States Embassy, Abidjan, July 7, 1964.)



## Japan

### EXPORT VALIDATIONS FOR FROZEN TUNA AND TUNA LOINS TO U.S., APRIL-MAY 1964:

Japan's export validations of frozen tuna and tuna loins to the United States for April-May 1964 totaled 14,047 short tons, valued at US\$5,046,945 as compared with shipments of 9,348 short tons valued at \$3,039,039 for the same period in 1963, an increase of 51 percent in quantity and 129 percent in value. Frozen tuna and tuna loins authorized to be shipped directly from Japan during April and May 1964 were 31 percent above the level reported during the same period in 1963; authorized transshipments were 5 percent less than those of the previous

Japan's Export Validations for Frozen Tuna to U.S., April-May 1964											
Species	Direct Shipment			Transshipped			Total Direct and Transshipped		Total Validated		
	April	May	Total	April	May	Total	April	May	April	May	Total
	(Short Tons)										
Albacore Round	2,190	2,068	4,258	1,579	1,181	2,760	3,769	3,249	7,020		
Yellowfin Round	-	-	-	146	60	206	146	60	206		
Gilled and gutted: 20/100 lbs. 100 lbs. up	1,583	1,081	2,664	383	397	780	1,966	1,478	3,445		
Dressed with tail	86	134	220	-	-	-	86	134	220		
Fillets	7	-	7	426	294	720	433	294	726		
Total	1,676	1,273	2,951	956	751	1,707	2,632	2,026	4,658		
Big-eyed Gilled and gutted: 20/100 lbs. 100 lbs. up	-	-	-	-	-	-	5	-	5		
Dressed with tail	-	-	-	24	-	24	24	-	24		
Fillets	2	3	4	-	-	-	2	3	4		
Total	2	3	4	24	-	24	31	-	31		
Skipjack Round	-	-	-	408	419	827	408	419	827		
Loins: Albacore	569	256	825	-	-	-	569	256	825		
Yellowfin	578	106	684	-	-	-	578	106	684		
Total	1,147	362	1,509	-	-	-	1,147	362	1,509		
Grand Total	5,015	3,708	8,723	2,972	2,351	5,323	7,987	6,059	14,047		
April-May 1963 Exports	2,336	1,435	3,770	3,924	1,652	5,577	6,260	3,087	9,348		
Percent increase or decrease	-115	-158	-131	-24	-42	-5	-28	-96	-51		

Source: Japan Freeze Food Exporters Association.

year. Albacore and yellowfin accounted for 83 percent of the total validated exports of frozen tuna and loins, of which 50 percent were albacore and 33 percent yellowfin. (Fisheries Attache, United States Embassy, Tokyo, June 29, 1964.)

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### EX-VESSEL PRICES FOR ALBACORE TUNA STILL HIGH IN JUNE 1964:

At Ishinomaki and Nakaminato, Japan, ex-vessel prices of 120 yen a kilogram (US\$302 a short ton) were being paid for 22-pound albacore. At Yaizu ex-vessel prices of 140 yen a kilogram (\$353 a ton) were being offered for 33-pound albacore.

But Japanese frozen albacore export trade with the United States began to show signs of activity in June 1964, with offers from United States buyers coming in at \$380 a ton c.i.f. However, export trade in albacore was still at a low level because of the high ex-vessel prices offered in Japan. (Suisan Tsushin, June 26, 1964.)

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### SUMMER ALBACORE TUNA FISHERY:

The Japanese summer albacore fishery was virtually over by mid-July 1964, with practically all fishing vessels either getting ready to return or already en route home. This year's (1964) summer albacore fishing conditions followed a very unusual pattern. Fishing was very slow at the outset of the season, but an unusually heavy run developed toward the end of the season. In early July, a sizable albacore run suddenly developed 350-400 miles off the Sanriku (northeastern Honshu) coast, where water temperatures measured 17°-18° C. (62.6°-64.4° F.). This resulted in record catches for albacore vessels operating out of Kesennuma, Onagawa, and Ishinomaki.

Ex-vessel albacore prices in Japan for 22-pound fish were reported in mid-July at 116-120 yen a kilogram (US\$292-302 a short ton) at Shimizu and Yaizu; 115-118 a yen a kilogram (\$290-297 a ton) at Kesennuma and Ishinomaki; and 110-116 a yen a kilogram (\$277-292 a ton) at Nakaminato. Prices of summer albacore contracted for export to the United States averaged \$375 a ton c.&f.). (Suisan Tsushin, July 15, 1964.)

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### SOUTH PACIFIC TUNA MOTHERSHIP FISHERY TRENDS, JUNE 1964:

The Japanese Yuyo Maru (5,040 gross tons) and Nojima Maru (8,800 tons) tuna mothership fleets fishing in the South Pacific were operating profitably as of late June 1964. Catches consisted largely of albacore and yellowfin tuna, but fishing was slowing down in late June.

The Yuyo Maru fleet, operating in the vicinity of the Fiji Islands, in early June was catching an average of about 5 metric tons a day per catcher vessel. In late June, she was averaging between 2.1-2.5 metric tons. The Nojima Maru fleet, operating in the fishing grounds south of Tahiti, averaged close to 3 metric tons a day in early June. In late June

## Japan (Contd.):

it was taking an average of 2.5 tons a day per catcher vessel. (Suisancho Nippo, June 20, 1964.)

\* \* \* \* \*

## JAPANESE TUNA EXPORTERS SEEKING MORE TRADE WITH SPAIN AND CUBA:

Japanese frozen tuna exporters, who are presently confronted with marketing problems owing to the sluggish export trade with European countries (particularly Italy), are discussing the possibility of expanding the tuna markets in Spain and Cuba. Tuna exports to Spain are presently restricted under a quota system enforced by that country, but the Japanese tuna exporters hope to seek greater trade through diplomatic negotiations. Tuna exports to Cuba are presently handled by only two Japanese fishing firms, but due to depressed tuna sales to other countries in recent months, other Japanese trading firms reportedly are showing interest in the Cuban market. However, because Cuba is a Communist country, some observers in Japan foresee difficulties in expanding trade with that country in view of the adverse effect it may have on the trade with the United States. (Nihon Suisan Shimbun, July 10, 1964.)

\* \* \* \* \*

## JAPANESE FROZEN TUNA EXPORTS TO CUBA INCREASING:

The Japan Export Frozen Tuna Producers Association, at a meeting held on June 30, 1964, to develop measures to overcome the slump in the sales of Atlantic-caught tuna, reported that tuna exports to Cuba have sharply increased in recent months. Sales to that country contracted during April-June 1964, totaled about 3,000 metric tons. During the same period, exports of Atlantic tuna to the United States amounted to 7,397 short tons, to Italy 5,225 metric tons, Yugoslavia 4,509 metric tons, and Czechoslovakia 940 metric tons. (Suisan Tsushin, July 2 & 4, 1964.)

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## FROZEN TUNA SALES TO ITALY SLOW IN JUNE 1964:

Japanese frozen tuna sales to Italy were extremely slow in June 1964 due to the tight money situation existing in Italy, coupled with the Italian packers' insistence upon yellowfin

tuna. Italian packers were reluctant to buy big-eyed and bluefin tuna. This situation is said to be presenting marketing difficulties for Japanese tuna suppliers, particularly since Japanese Atlantic tuna catches have been predominantly big-eyed and bluefin tuna.

Export prices paid for yellowfin (gilled-and-gutted) deliveries to Italy in June were at US\$395 a metric ton c. i. f., compared with \$410 offered early this year. Dressed big-eyed tuna, which earlier this year sold for \$360 a metric ton in the Italian market, has declined to around \$270 a ton, with very few offers being made even at that price. Bluefin price was \$330 a metric ton c. i. f. in June compared with \$380 offered early this year. (Suisancho Nippo, June 29, 1964, and other sources.)

\* \* \* \* \*

## ESTABLISHMENT OF OVERSEAS TUNA BASE COUNCIL UNDER STUDY:

The Japanese Fisheries Agency is studying the possibility of establishing an overseas tuna base council to assure the stable operation of overseas-based fisheries. The plan under study is aimed at organizing, under the Agency's guidance, a council consisting of overseas-based fishery operators to promote liaison among the operating firms and to resolve problems related to fish prices, labor, and other problems of common interest.

Reportedly, the Japanese overseas tuna bases at American Samoa, Espiritu Santo (New Hebrides), Noumea (New Caledonia), Levuka (Fiji Islands), and Penang (Malaysia) are faced with growing economic difficulties resulting from declining hook catch rates, rising labor demands, unsatisfactory price agreements, and unfavorable arrangements for settling claims arising from green-meat tuna deliveries. Those problems are said to be imposing difficulties in managing overseas base-operated tuna fisheries. (Suisan Keizai Shimbun, June 28, 1964.)

\* \* \* \* \*

## JAPANESE NEGOTIATE WITH PORTUGUESE FIRM FOR TUNA BASE OFF WEST AFRICAN COAST:

A Japanese fishery company announced its plans to export tuna caught by Japanese vessels in the Atlantic Ocean under a business agreement with a firm in Portugal and with a United States tuna packer.



## Japan (Contd.):

Under the plan, the Portuguese Territory of Cabo Verde, a group of islands off the west coast of Africa, will be used as an operating base from which frozen tuna will be shipped to Europe, the United States, and Japan.

As of mid-June 1964, the Japanese fishery company was operating 2 tuna vessels in the Atlantic Ocean. Under an arrangement with the Kanagawa Tuna-Bonito Fisheries Federation in Africa, 10 additional tuna vessels were to be added to the fleet. As of June 1964, those vessels were en route to the Atlantic Ocean area.

The annual catch of the Japanese fishing fleet is expected to total 10,000 tons. Of the total, 6,000 tons will be shipped to the United States tuna-packing firm's cannery in Puerto Rico, 2,000 tons to European markets, and the remaining 2,000 tons to Japan.

The Japanese firm has sent its representative to Sao Vicente Island of the Cabo Verde group to handle the fisheries business there. On the basis of the business negotiations, the Portuguese will provide refrigeration and land facilities at the fishing base at Sao Vicente as well as act as agent for the Japanese fishing vessels. The Japanese firm will provide the fishing vessels and handle the sale of tuna to the United States, Europe, and Japan. The United States firm will supply ships to transport the tuna to its cannery at Puerto Rico.

Until now, most of the Japanese fishing vessels in the Atlantic Ocean area have operated mainly from bases in the Canary and Las Palmas Islands. (Fisheries Attache, United States Embassy, Tokyo, June 16, 1964.)

\* \* \* \* \*

#### POLE-AND-LINE SKIPJACK TUNA FISHERY BEING STUDIED:

Major Japanese fishing companies, which are confronted with the problem of declining hook catch rates in the tuna long-line fishery, are looking into the possibility of expanding the pole-and-line skipjack fishery. In view of the abundance of the skipjack resource and the stability of skipjack prices, several fishing firms see unlimited possibilities of expanding the pole-and-line skipjack fishery through improvement in gear and fishing

methods. One possibility they are considering is to replace the pole-and line fishing method with purse-seining. (Suisan Keizai Shimbun, July 5, 1964.)

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#### TUNA BEHAVIOR NEAR DRIFTWOOD STUDIED:

The Tokai University Fisheries Research Laboratory, which has for some time been studying the behavior pattern of tuna associated with driftwood, was planning to release 300 manmade small yellow-colored planks and logs east of the Philippine Islands in late June 1964. Commercial tuna fishing vessels (which have been cooperating in the study were on their way to the Indian Ocean) to release the manmade driftwood. The pieces of driftwood are expected to drift off the Japanese mainland between late July and December. The study is being financed by research funds from the Ministry of Education. (Suisan Keizai Shimbun, June 16, 1964.)

\* \* \* \* \*

#### TUNA FISHING LICENSES DECLINE IN VALUE:

Tuna fishing licenses in Japan in early June 1964 were selling at a premium of 350,000-360,000 yen (US\$972 to \$1,000) per vessel (gross) ton, or about 70,000-100,000 yen (\$194-278) less than a year earlier.

The decline in market value of fishing licenses is attributed to the less promising outlook for the tuna fishery. (Suisan Keizai Shimbun, June 2, 1964.)

Note: The entry of fishing vessels in the Japanese tuna fishery is closely regulated by the Japanese Government and fishing licenses (or "rights" as they are commonly referred to) are openly traded on the open market. The premium that a license fetches depends on demand and supply.

\* \* \* \* \*

#### FISHING COMPANY TO FLY REPLACEMENTS FOR TUNA LONG-LINE CREWS:

A Japanese fishing company, which is operating five 112-ton tuna long-liners in the Atlantic Ocean and the Caribbean Sea from the base at Trinidad, is planning to fly crew replacements from Japan for its Atlantic tuna vessels. Negotiations with an airline for special rates were said to be under way, and the fishing company may start flying replacements before the end of this year.

## Japan (Contd.):

The fishing company estimated that air transportation of replacements would result in additional earnings of about 10 million yen (US\$27,778) per vessel. This is because each vessel would, under the plan, be able to make 3 more fishing trips for additional landings worth 15 to 16 million yen (\$41,667-44,445). Deducting 6 million yen (\$16,667) for round-trip flight expense for replacements (22 per vessel), the vessel would net around 10 million yen (\$27,778). Moreover, air transportation would benefit the fishermen, who would be spared the discomfort of a long sea journey.

Under a similar arrangement, another Japanese fishing company, in the summer of 1963, flew 51 fishermen to the Canary Islands as replacements for crew members aboard its trawler operating in the Atlantic Ocean. (Suisancho Nippo, July 2, 1964, and other sources.)

\* \* \* \* \*

TANKER REFUELS TUNA  
LONG-LINERS AT SEA:

The Japanese oil tanker Tofuku Maru (1,983 gross tons), which departed Japan on May 13, 1964, as of mid-June had refueled on the high seas a total of 23 tuna long-line vessels. The tanker is supplying to each fishing vessel about 50-100 kiloliters of oil, 10 tons of drinking water, and provisions. She was scheduled to refuel 20 more tuna vessels at sea before proceeding to Balboa, Panama, on July 13, for fuel and provisions. (Suisan Keizai Shimbun, June 16, 1964.)

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TUNA MOTHERSHIP IN  
INDIAN OCEAN CONFRONTED  
WITH LABOR DISPUTE AT SEA:

The Japanese portable-boat-carrying tuna mothership Showa Maru No. 1 (1,076 gross tons), which had been fishing in the Indian Ocean on a six-months trip schedule, was compelled to terminate her operations one month earlier due to a labor dispute which broke out between the crew members and vessel owners. The vessel, upon returning to Shimizu, Japan, on June 25, 1964, was being investigated by the Shimizu Maritime Safety Regional Headquarters. Investigations thus far indicate the possibility of low wages and overworking of crew members as having led to the labor dispute at sea.

Under a labor agreement concluded between the owners of the mothership and the Japan Seamen's Union, crew members of the Showa Maru No. 1 were guaranteed a minimum wage of 300,000 yen (US\$833.30) a trip, plus a share of the catch, with adjustments to be made if earlier withdrawal of operations became necessary or if the catch was poor. One crew member aboard the vessel expressed strong discontent over the wages paid. He felt they averaged below those paid by other smaller vessels when considering the greater output of labor demanded by large motherships.

The Japanese Ministry of Transportation, concerned over this development and other occurrences of wage disputes in the distant-water tuna fishery, directed the Maritime Transportation Bureau to develop appropriate administrative measures to ensure harmonious labor-management relations and discipline aboard fishing vessels. (Suisancho Nippo, June 29; Suisan Keizai Shimbun, June 21, 1964.)

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SOUTH KOREA ASKS JAPAN TO  
LIBERALIZE VESSEL EXPORTS:

At an informal conference held between the Republic of South Korea and Japan on June 24, 1964, at Tokyo, the Korean Government delegation submitted to the Japanese delegation a plan for economic cooperation between the two governments. The Korean proposal called for the liberalization of regulations governing exports of fishing vessels to South Korea, and for an increase in the Japanese import quota for Korean marine products.

Japan is reported to have taken the position that the export of vessels will not be liberalized as long as South Korea continues to seize Japanese fishing vessels. As for increasing the quota for Korean imports, Japan plans to further study the matter.

Concerning the matter of fishing vessel exports, Japan is reported as having adopted a basic policy to (1) first discuss the matter with concerned governmental agencies; (2) limit exports to wooden vessels over five years old; and (3) restrict exports to vessels which will not create an adverse effect on Japan's fishery; but South Korea must first stop seizing Japanese fishing vessels.

## Japan (Contd.):

The Republic of Korea is said to be interested in purchasing from Japan over 30 tuna vessels, not to mention other types of fishing vessels, as part of the economic trade agreement. (Suisan Tsushin, June 26 & July 1, 1964.)

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# NORTH PACIFIC SALMON CATCH AS OF MID-JUNE 1964:

The Japanese salmon catch in the northern waters (North Pacific, Bering Sea, etc.) by motherships as well as by land-based gill-



Part of a catch aboard a Japanese high-seas salmon mothership in the North Pacific area.

net and long-line fleets was as of mid-June 1964 below the catch for the same period last year. The catch, as of June 15, totaled 14,000 metric tons for motherships, 15,000 metric tons for land-based gill-netters, and 6,000 metric tons for land-based long-liners. The mothership catch was running about 50 percent red salmon, followed in order by chums and pinks. (Suisancho Nippo, June 22, 1964.)

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# MOTHERSHIP SALMON CATCH IN NORTH PACIFIC REPORTED POOR:

The salmon catch by the 11 Japanese salmon motherships operating in Area A (north of 45° N. latitude) in the North Pacific Ocean was reported poor. Landings up to early July 1964 amounted to about 24,000 metric tons as compared with the catch quota

of 44,665 metric tons allotted to the mothership-type fishery. The catch is said to be running about 40 percent red salmon and 50 percent chum. At that rate, the Japanese salmon industry fears the red salmon catch for the season may be more than 10 percent below that for 1963, when red comprised about 40 percent of the total mothership salmon catch. (Shin Suisan Shimbun; Sokuho; July 9, 1964.)

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# RECORD LOW SALMON CATCH EXPECTED FOR AREA B:

The 1964 Japanese land-based gill-net and long-line salmon fishing in Area B (south of 45° N. latitude) of the Northwest Pacific was brought to a close on June 30, 1964, in accordance with the agreement under the Japan-U.S.S.R. Fisheries Treaty. There is a possibility that this season's catches will be at a record low for that area. Based on 31,000 metric tons of salmon taken in Area B as of June 25, the Japanese Fisheries Agency estimates the salmon catch for that area to total about 40,000 metric tons. The estimated catch is far behind the 55,000-ton quota established for that area, and also below the 1962 poor pink salmon catch. (Suisan Keizai Shimbun, July 1, 1964.)

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# HOKKAIDO CANNERS HARD HIT BY POOR SALMON CATCH:

Hokkaido, Japan, salmon canners are said to be extremely hard hit by the unprecedented poor salmon catches taken from Area B (south of 45° N. latitude) in the North Pacific this year. Of the 8 salmon packing plants located in Kushiro, Hokkaido, all but 1 had suspended operations as of June 20, 1964. Normally Hokkaido canneries are operating at full capacity in June-July, packing the "dollar-earning" pink salmon, but this year, with the scarcity of raw material pushing up pink salmon prices as high as 245 yen per kilogram (30 cents a pound), the Kushiro canners could no longer continue their operations without large losses. (Minato Shimbun, July 9, 1964.)

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# PACK OF LAND-BASED SALMON CANNERS DOWN:

The canned salmon pack (for export) of the land-based salmon canners in Japan as of early July 1964 was estimated to total 200,000

## Japan (Contd.):

cases of  $\frac{1}{4}$ -lb. pack and 50,000-60,000 cases of  $\frac{1}{2}$ -lb. pack. For the 1964 season, the pack of  $\frac{1}{4}$ -lb. cans was expected to total 225,000 cases and for  $\frac{1}{2}$ -lb. cans, 100,000 cases. In 1963, the pack of export canned salmon totaled 370,000 cases. (Suisan Tsushin, July 6, 1964.)

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# MOTHERSHIP BOTTOMFISH AND SHRIMP FISHERY IN EASTERN BERING SEA, JUNE 1964:

The 14 Japanese mothership-type bottomfish fishery fleets operating in the eastern Bering Sea had landed from 120,000-130,000 metric tons of fish as of early June 1964, exceeding last year's catch for the same period by 25 percent. The vessels operating trawl gear were doing well, but some of those fishing with long-line gear were not. Alaska pollock, cod, rockfish, and flatfish were the principal finfish landed.



Japanese factoryship Einin Maru.

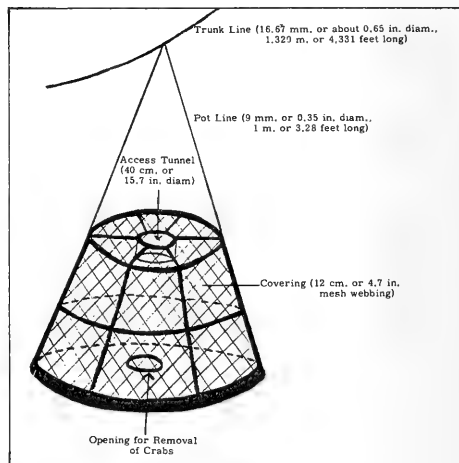
The factoryships fishing for shrimp were having good fishing as of mid-June 1964. The Chichibu Maru (7,421 gross tons) arrived in Hakodate on June 16 with about 62,000 cases of canned shrimp and 7,000 metric tons of frozen shrimp. She was scheduled to return to the eastern Bering Sea in August. The Einin Maru (7,482 gross tons) had canned 90,000 cases of shrimp, or one-third of its production target as of that date. (Suisan Keizai Shimbun, June 16, and Suisan Tsushin, June 18, 1964.)

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# NEW CRAB FISHERY DEVELOPED IN JAPANESE COASTAL WATERS:

In mid-December 1963, commercial concentrations of a crab known as ibara-gani (Lithodes species of the family Lithodidae) were discovered 40-50 miles off the northeast coast of Japan. During January-March

1964, a total of 12 Japanese vessels fished the newly discovered grounds from base ports in Fukushima and Miyagi Prefectures. Operations were centered 30-50 miles off Shiroyazaki in depths ranging from 480-500 meters (1,574-1,640 feet). Complete catch data are not available, but it has been reported that during January-March 1964, 7 vessels (ranging from 37 to 97 gross tons) of the fleet landed at Onahama Port, Fukushima Prefecture, a total of 45,482 ibara-gani crabs with a total ex-vessel value of US\$17,126. Wholesale prices ranged from 100 yen (\$0.28) per crab for those weighing less than 1 kilo (2.2 pounds) to 150-160 yen (\$0.42-0.44) per crab for those weighing over 1 kilo.



Crab pot used in ibara-gani fishery. The truncated-cone-shaped pot is 60 centimeters (23.6 inches) high, with a base diameter of 160 centimeters (63 inches), and a top diameter of 75 centimeters (29.5 inches). Framework is constructed of iron rods 9 mm. (0.35 inch) in diameter with the rod in the base ring 12 centimeters (4.7 inches) in diameter. The top ring is made of vinyl chloride tubing 15 mm. (0.59 inch) in diameter.

Crab pot gear is used in the ibara-gani fishery. The pots are fished in units of 30-40 pots to a string. A string of pots is fished using round bottles 12 inches in diameter fitted with bamboo poles 18 feet long as marker buoys. The buoys are equipped with radio transmitters as an aid in locating the gear. A single buoy serves as a marker for one string of pots. Rope 16.67 millimeters (0.65 inch) in diameter is used for the trunk and buoy lines. The length of the trunk line for a single string of pots is approximately 1,320 meters long. The pots are fastened to the trunk lines

## Japan (Contd.):

at 30- to 35-meter (98-118 feet) intervals with rope 1 meter (3.28 feet) in length and 9 millimeters (0.35 inch) in diameter. Two anchors, either of iron or stone, secure the ends of the trunk lines to the seabed. The gear is hauled on deck amidship and, after removal of the catch, the pots are reset from the afterdeck. The total cost of rigging 4 strings of pots (40 pots per string), including replacement pots, trunk and buoy lines, buoys, and anchors, is estimated at 2-2.5 million yen (\$5,555-6,944). Vessels in the fishery leave port early in the morning and return the same day. The time required for hauling and resetting 100-160 pots is approximately 10 to 12 hours. It is reported that the larger vessels in the fishery carry 12 to 13 crew members.

At first, 3 or 4 saury were hung in the pots as bait but because of the loss of bait to invertebrates and other sea animals, this method of baiting was discontinued. A perforated polyethylene cylinder (with screw cap) was later devised to protect cut-up pieces of bait consisting of frozen saury or squid. Two such baited cylinders are hung in each pot from a point near the access tunnel.

On February 29, 1964, Ibaraki fishermen of Fukushima Prefecture organized the Fukushima Crab Pot Fisheries Association for the purpose of protecting the stocks of crabs in the area. The following regulations were adopted:

1. Female crabs shall be released. However, female crabs may be retained if not in excess of 5 percent of the total catch.

2. Vessels are required to shift operations when female crabs exceed 30 percent of the total catch per string of pots.

3. Regulations 1 and 2 above are applicable to the catch of male crabs having a carapace of less than 10 centimeters (3.9 inches).

4. The number of crab pots fished per vessel shall not exceed 160.

5. The maximum tonnage of a vessel engaged in the fishery shall not exceed 100 gross tons.

6. Fishing shall be conducted in waters outside the range of the trawl fishery.

The production potential of the new fishery cannot be determined from the limited data now available. (Fisheries Attache, United States Embassy, Tokyo, July 13, 1964.)

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#### ATLANTIC TRAWL FISHERY, 1963:

In calendar year 1963, 34 Japanese trawlers operated in the Atlantic Ocean off West Africa. They produced a total of 92,000 metric tons of bottomfish, consisting of 39,000 tons of sea bream, 18,000 tons of "monko" squid, 7,000 tons of octopus, and 28,000 tons of miscellaneous fish (including mackerel and "merluza"). Of that total 38,300 metric tons were exported to European and African countries, as follows (in metric tons): Ghana 11,500, Italy 5,500, Nigeria 5,500, Greece 4,000, Spain 3,500, others (including Rumania, Liberia, and Sierra Leone) 8,300. These data were reported by the Japanese Fisheries Agency. (Shin Suisan Shimbun, June 22, 1964.)

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#### REFRIGERATED CARRIERS BEING BUILT FOR ATLANTIC TRAWL FLEET:

A large Japanese fishing company as of early July 1964 had under construction two 1,800-ton refrigerated fishery carrier vessels, scheduled to be employed for transporting Atlantic trawl catches back to Japan. The same firm is also planning to build two more similar carrier vessels for the Atlantic run. Upon completion of those 4 vessels, the firm will have a total of 6 refrigerated carrier vessels serving its Atlantic trawl fleet, including the two 1,800-ton carrier vessels (Banshu Maru Nos. 11 & 12), built earlier this year and now assigned to the Atlantic Ocean fishery. (Minato Shimbun, July 8, 1964.)

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#### STERN-TRAWLER CANNERY BUILT FOR SHRIMP FISHERY:

Another Japanese fishing firm is building a 3,500-ton stern trawler equipped with a canning plant, the first Japanese trawler to be equipped with canning facilities. The trawler, which was scheduled to be launched on July 23, 1964, will have a daily production capacity of 500 cases (24 8-oz. cans) of canned shrimp. Unlike factoryships which require a fleet of catcher vessels, the new vessel will be capa-

## Japan (Contd.):

ble of operating independently. The firm plans to assign the trawler to the shrimp fishery in northern waters (Bering Sea, North Pacific Ocean, Okhotsk Sea) where factory-ship-type shrimp operations have often proved to be unprofitable due to the high operating costs of factoryship-type fleet operations. (Minato Shimbun, July 4, 1964.)

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#### FISHING VESSEL CONSTRUCTION PERMITS ISSUED JUNE 16, 1964:

On June 16, 1964, the Japanese Fisheries Agency issued permits for the construction of 21 fishing vessels: 8 wooden vessels (totaling 378 gross tons) and 11 steel vessels (totaling 6,931 gross tons). Included were permits for a 999-ton steel trawler, two 2,530-ton fish carriers, two 99-ton tuna long-liners, a 499-ton portable-boat-carrying tuna mothership and a 19-ton portable boat. (Suisan Keizai Shimbun, June 17, 1964.)

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#### FISHERY PRODUCTION IN 1963:

The 1963 Japanese fishery production totaled 6,697,000 metric tons (excluding whale production), according to data released by the Fisheries Statistics Section, Japanese Ministry of Agriculture and Forestry. The 1963 production was down about 160,000 metric tons from 1962 landings (which totaled 6,860,000 metric tons). For the first time since 1955, fishery production in Japan failed to maintain the steady annual growth that had been recorded until 1962.

Tuna long-line catches in 1963 totaled 532,000 metric tons, a 0.6-percent decrease from 1962. Pole-and-line tuna fishery production in 1963 with 158,000 metric tons declined 16 percent below 1962.

The distant-water trawl fishery with 793,000 metric tons of landings in 1963, showed a 14-percent decrease from 1962. This decline was primarily ascribed to reduced mothership fleet operations in the "northern waters" (North Pacific, Bering Sea, etc.) bottom trawl fishery in 1963. Catches of 113,000 metric tons from distant-water trawl operations in the Atlantic Ocean and in waters off New Zealand and Australia, on the other hand, were reported to have almost doubled those for 1962.



Fig. 1 - A 30-foot long-liner bringing the morning's catch of marlin and tuna to the mothership. Note skates of line forward.

A review of Japanese fishery production trends shows that from 1957 to 1961, the distant-water fisheries (pole-and-line and long-line tuna fisheries, bottom trawl fishery, and mothership-type salmon and crab fisheries)

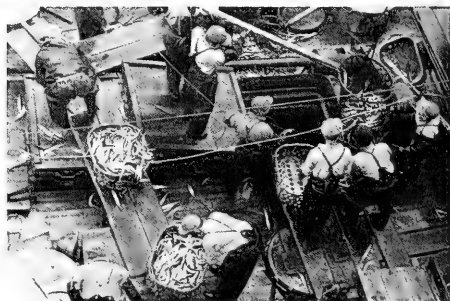


Fig. 2 - Washing and packing mackerel aboard a Japanese fishing vessel.

## Japan (Contd.):

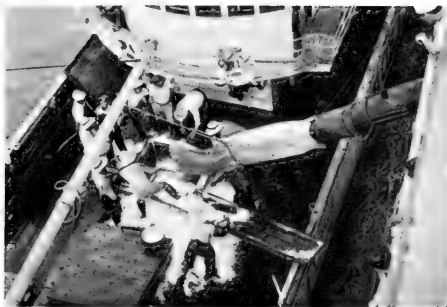


Fig. 3 - Icing a catcher boat alongside a Japanese mothership.



Fig. 4 - Repairing nets aboard a Japanese mothership.

primarily accounted for Japan's yearly production growth. Those fisheries combined showed an annual average increase of 14 percent as compared with only 5.4 percent for inshore fisheries and 2.7 percent for offshore fisheries. However, the distant-water fishery production after 1961 began to decline at a rate of 13 percent each year, and in 1963, the production of 1,520,000 metric tons was 9 percent below 1962. (Suisan Keizai Shim-bun, July 4; Nihon Keizai Shim-bun, July 4, 1964.)

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#### STATUS OF 1963 OVERSEAS-BASED FISHERIES TO BE STUDIED:

The Finance Committee of the Japanese House of Councilors (Upper House) is ex-

pected to begin a study of the status of the Japanese overseas-based fisheries in connection with tariff and labor problems. The Committee has called on the Japanese Fisheries Agency to furnish data on those fisheries, and the Agency has supplied the following data to that Committee:

Status of Japan's Overseas-Based Fisheries, 1963					
Area	Vessels	Fishermen	Catch		Value
			Metric Tons	Yen (Million)	US\$
Pacific Ocean	147	3,100	21,000	2,000	5.6
Indian Ocean	35	850	4,300	400	1.1
Atlantic Ocean:					
Tuna fishery	127	4,900	95,300	11,900	33.1
Trawl fishery	34	1,900	92,000	11,200	31.1

The amount of foreign exchange earned by the overseas-based fisheries is reported to be: Pacific Ocean 1,850 million yen (US\$5.1 million); Indian Ocean 230 million yen (US\$0.6 million); Atlantic Ocean (tuna) 11,380 million yen (US\$31.6 million); and Atlantic Ocean (trawl) 2,640 million yen (US\$7.3 million). (Minato Shim-bun, June 5, 1964.)

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#### NEW FISHING PORT IN OSAKA PREFECTURE:

The relatively minor port city of Izumisano in Osaka Prefecture will become one of Japan's largest fishing ports if plans under consideration are developed. With the intention of reducing the transportation costs for fresh fish consumed in the Kobe-Osaka area, Osaka Prefecture has begun building a completely new fishing port at Izumisano City just south of Sakai. That area's supply of fresh fish now comes from such distant ports as Shizuoka and Shimonoseki with the result that transportation costs are high. Following the completion of Izumisano Port, fishing vessels would be able to deliver their catches practically to Osaka's doorstep.

In December 1963, Osaka Prefecture began to reclaim about 300 acres of land from the sea. It is planned that the land will be used by about 5 private fishing companies for their processing plants, refrigeration facilities, and ship maintenance buildings. The Japanese Government also plans to build a large refrigerated storage facility. Four large refrigeration factoryships of 15,000 gross tons each and 10 fishing vessels in the 3,000-ton class would be able to dock in the port at one time. Prefectural officials estimate that 170,000 metric tons of fish would

## Japan (Contd.):

pass through the port annually. Railway and road connections will be constructed to connect the port with Osaka City and the rest of the Kinki.

It was reported that Japan's five largest fishing companies have informally agreed to establish plants in Izumisano, but final negotiations cannot be undertaken until the Prefecture determines the cost of the land. Such a determination is to be made upon completion of the reclamation work in about four years. Prefectural officials say the project is certain to be a success.

The cost of the reclamation project is estimated at 800 million yen (US\$2.2 million) of which about \$425,000 is to be financed by the national Government and the balance covered by public bonds.

Concern for the high cost of transportation and distribution of food products is reported to be growing in Japan and the Izumisano project would doubtless be a forerunner for other moves to centralize food production nearer the centers of consumption. Such developments should favorably affect prices, but they will also have the effect of bringing more people and industries into the already congested metropolitan centers.

Izumisano Port, with its centralized modern facilities, would be a further contribution, to the productivity of the already highly efficient Japanese fishing industry. This proposed project is seen as further evidence of Osaka's strong push to develop new seaboard industrial complexes and renew the area's economic strength by diversification. (United States Consulate, Kobe-Osaka, June 24, 1964.)

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#### FROZEN FISH SALES PROMOTION PLANNED:

The Japan Frozen Fish Association, whose objective is to promote domestic sales of frozen fishery products, held its first inaugural meeting at Tokyo on June 1, 1964. The Association plans to employ the mass media for promotional purposes and seek to improve the quality of frozen fishery products. It also plans to establish 20 model frozen fish stores in Tokyo.

The Association members include the six largest fishing companies in Japan and the

National Federation of Fishermen's Cooperative Associations (ZENGYOREN). The Japanese Government is subsidizing one-half of the Association's Fiscal Year 1964 (April 1964-March 1965) budget of 40 million yen (US\$111,000). (Suisan Keizai Shimbun, June 2, 1964.)

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#### FISH MEAL AND SOLUBLES USED IN MIXED FEED, 1958-1963:

Japan's use of protein concentrates (all sources) in the production of mixed feed for livestock has increased almost fivefold in the last six years. Fish meal accounted for 35.2 percent of the total protein concentrates used in mixed feed in 1958, but only 27.9 percent of the total in 1963. However, fish solubles were used as an ingredient in mixed feed for the first time in 1963 and accounted for 5.8 percent of the total (see table).

Japan's Consumption of Protein Concentrate in the Mixed Feed Industry					
Commodity	Year				
	1963	1962	1961	1960	1959
Fish meal and cake . . . . .	286.4	225.7	213.3	149.4	101.3
Fish solubles . . . . .	59.4	-	-	-	-
Vegetable oil . . . . .	680.1	526.5	435.9	292.0	187.2
Feed meals . . . . .	1,025.9	752.2	649.2	441.4	288.5
Total . . . . .	1,025.9	752.2	649.2	441.4	288.5

The increase in usage of protein concentrates reflects the sharp upward trend that has occurred in Japan's mixed feed industry as a result of increased demands by the fast-growing livestock industry. (Foreign Agriculture, June 29, 1964, U. S. Department of Agriculture.)

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#### ANTARCTIC WHALE CATCH AND PRODUCTS PRODUCED, 1963/64:

Japan's seven whaling fleets caught 4,599.83 blue-whale units during the 1963/64 Antarctic whaling season, reported the Japanese Fishery Agency this past July. Japan thus attained its quota of 4,600 units of the 10,000 blue-whale units set by the International Whaling Commission.

The baleen whale catch yielded 12 percent more oil than the target set. Other products exceeding the target were frozen whale meat (up 4 percent), salted meat (up 1 percent), and sperm whale oil (up 19 percent). (Fisheries Attache, United States Embassy, Tokyo, July 15, 1964.)



## Japan (Contd.):

Japan's Antarctic Baleen Whale Catch, Products Produced, and Sperm Whale Oil Output, 1963/64 Season (Figures in Parentheses Indicate Targets of Catch and Production)						
Fleet	Products Produced					Yield of Sperm Whale Oil
	Catch	Baleen Oil	Frozen Meat	Salted Meat	Meal	
	<u>Blue-Whale Units</u>	<u>(Metric Tons)</u>				<u>Pounds</u>
<u>Tonan Maru</u> . . . . .	706.00 (706.10)	13,923 (12,708)	26,190 (21,180)	1,307 (1,151)	120 -	17,017 (14,786)
<u>Tonan Maru No. 2</u> . . .	715.33 (706.11)	15,218 (12,708)	25,709 (21,180)	1,270 (1,151)	120 -	15,957 (14,786)
<u>Nisshin Maru</u> . . . . .	787.50 (761.66)	17,480 (14,471)	23,196 (21,438)	1,194 (1,164)	531 (410)	21,098 (16,790)
<u>Nisshin Maru No. 2</u> . . .	746.66 (761.66)	15,250 (14,741)	21,525 (21,438)	1,178 (1,164)	1,625 (1,582)	21,281 (16,790)
<u>Nisshin Maru No. 3</u> . . .	110.00 (111.15)	1,645 (2,111)	3,790 (3,128)	67 (52)	70 (64)	4,464 (2,449)
<u>Kyokuyo Maru No. 2</u> . .	848.18 (761.66)	18,210 (14,091)	23,584 (20,184)	668 (800)	1,343 (1,249)	33,510 (18,470)
<u>Kyokuyo Maru No. 3</u> . .	686.16 (761.66)	13,650 (14,091)	20,424 (20,184)	559 (692)	1,268 (1,249)	8,320 (18,470)
Total . . . . .	4,599.83	95,376	144,418	6,243	5,077	121,647
Target . . . . .	(4,600.00)	(84,921)	(138,734)	(6,174)	-	(102,541)

Note: See Commercial Fisheries Review, May 1964 p. 62; January 1964 p. 60.

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### CULTURED PEARL QUALITY IMPROVED BY USE OF ANTIBIOTIC:

Modern science has come to the aid of Japan's 500-year old cultured pearl industry, and the result is healthier oysters and bigger and better pearls. The key to increased pearl production is a new technique using the antibiotic aureomycin chlortetracycline.



Pearl oyster rafts in Kaskiojima Ago Bay, Japan.

A scientist on the staff of the Fisheries School of Mie Prefecture in south central Japan, in an article in the Japanese publication Fishery Science Monthly, described tests extending over 4 years in which the

antibiotic boosted production of top-quality pearls by as much as 30 percent. These are the brilliant "hanadama" or "moon tear" pearls, perfect in shape and without a stain, and which over the past 70 years have been hardly 5 percent of the total yield, the scientist said.

The special aureomycin formulation, developed by an internationally known drug firm, also led to an important increase in total pearl yield, a decrease in the percentage of valueless blemished pearls, and lowered the "death rate" among weak pearl oysters.

In the new technique, both oysters and the instruments used to insert the nucleus are dipped in a solution composed of 10 parts aureomycin to one million parts of sea water. The mantle piece is dyed with 2 percent mercurochrome solution which has been diluted by sea water containing 20 parts per million of the antibiotic.

The Japanese scientist attributed the improved rate of pearl production and the higher quality of pearls harvested from treated oysters to the broad-spectrum action of aureomycin against bacteria. He decided that bacteria, which enter the oyster at the time of impregnation with the nucleus and mantle piece, adversely affect pearl formation. (Australian Fisheries Newsletter, March, 1964.)



## Republic of Korea

### NEGOTIATIONS FOR ADDITIONAL TUNA VESSELS:

On May 28, 1964, the Economic Ministers of the Korean Government approved an arrangement for a newly established company in Seoul, Korea, to import ten 300-ton tuna fishing vessels from a Japanese firm. Since the Korean Government decided in February 1964 not to issue repayment guarantees for private commercial loans, Cabinet approval of the transaction will be required. The value of the contract was cited as US\$2.7 million in principal; terms are repayment in 10 years (after a grace period of a year and a half); with interest of 6 percent per year.

On June 2, 1964, the Foreign Investment Promotion Committee of the Korean Government approved an arrangement whereby a shipbuilding firm in Pusan, Korea, is to obtain a loan of \$380,000 from a Japanese firm which will be used for the construction of 10 vessels. Two of the vessels are to be freighters of 500 tons each, while 4 are to be 140-ton long-line tuna vessels, and 4 are to be 100-ton trawlers. The Japanese loan for the Pusan shipbuilding firm must be approved by the Economic Ministers as well as the Cabinet of the Korean Government. It is understood that the Korean shipbuilding firm plans to import some components from the Japanese firm and to construct the vessels in Pusan yards. Terms call for the Japanese firm to meet its obligation within seven months after final approval of the loan by the Korean Government. Payment is to be in annual installments in the 5 years following the approval of the imported materials.

By July 1964, the Korean shipbuilder in Pusan was scheduled to complete six 145-ton tuna vessels which the company has been constructing for a Korean company under a loan from a United States tuna canning company.

The current reluctance of the Korean Government to guarantee repayment may prevent conclusion of the tentative agreements described above. The proposed new vessels would be a significant addition to the 40 vessels (totaling 5,855 tons) which private Korean companies have undertaken to procure and for which the Korean Government has guaranteed loans in the past year. Also, initial deliveries are due early in 1965 of the 91 vessels covered under the first phase of the contract with the Italian-French Consortium. (United States Embassy, Seoul, June 16, 1964.)



## Liberia

### FISHING INDUSTRY UNDERGOING MODERN EXPANSION:

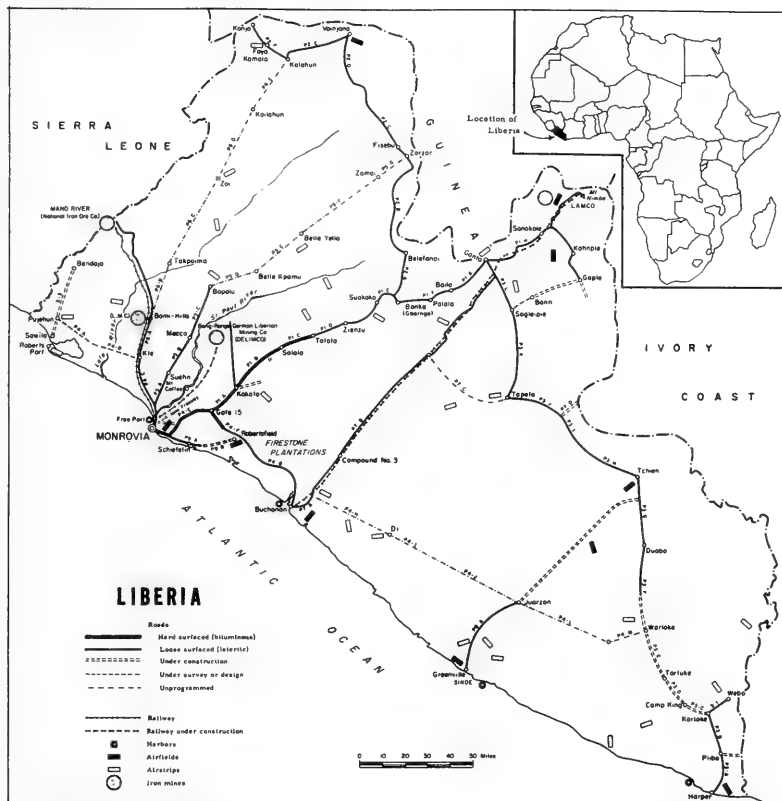
The Liberian commercial fishing industry has experienced a spectacular development since mid-1963, the impact of which is being felt throughout the country. Liberia's largest fishing company recognized the need for increased quantities of low-priced fishery products, as well as the need for modern distribution methods in order to reach the country's inland areas. That fishing company and its affiliates is made up of Liberian interests, some members of the Liberian Government, and Danish interests. Affiliated companies in other countries include firms in Sierra Leone and Nigeria. To achieve its goals, the Liberian fishing company has taken the following major steps:

1. Contracted with about 11 foreign-flag offshore trawlers (mostly Japanese) to deliver fish that is frozen at sea to Monrovia. The frozen fish will be in boxes of 20 kilograms (44 pounds) each. Species will include mackerel, red snapper, black snapper, herring (sardinella), and sole. Monthly landings in May 1964 reached an average of close to 700 metric tons. The landings are expected to reach 1,000 tons by the end of 1964.
2. Invested in a fleet of insulated and, in some cases, refrigerated trucks for delivery of frozen fishery products in good condition to inland areas.
3. Built a new and modern freezing, cold-storage and ice plant at Monrovia capable of storing up to 1,500 tons of frozen fishery products, freezing up to 100 tons of fish a day and producing 30 tons of block ice a day. The cold-storage plant was to be expanded to a capacity of 4,000 tons.
4. Built 6 inland cold-storage depots (a seventh is planned) at strategic locations throughout Liberia, with storage capacities of from 20 to 120 tons each (mostly 20 to 25 tons). Those are located at the population centers and cover all of the interior of Liberia with the exception of parts of the Eastern Province, which are inaccessible until the road construction project being planned is completed.

The Liberian fishing company is trying hard to maintain the retail price level of its fish within reach of the population as a whole. As of June 1964, wholesale prices ranged from US\$4.50 to \$7.00 a carton of 20 kilos (10 to 16 U.S. cents a pound), with average retail prices between 15 cents and 20 cents. The demand for fishery products has been very strong, and the quantity distributed inland from the cold-storage depots was climbing steadily. Some 50 percent of the total was being distributed inland and the remaining 50 percent was consumed in the Monrovia area (containing about one-third of the nation's population of about 1 million).

Fishery landings of 700 tons in May, or 8,400 tons a year, compares with only 795 tons for all of 1963, which was a poor year, and about 1,700 tons for each of 1962 and 1961. One of the reasons for the low 1963 landings was that all of the fishing vessels of Liberia's foremost fishing company, which landed the bulk of the local catches, were transferred to Sierra Leone for repairs and servicing. Another reason was that the Libe-

## Liberia (Contd.):



erian fisheries were undergoing a transition and that the formerly higher landings suddenly dropped due to a number of factors inherent to a transition period.

As of mid-1964, three smaller inshore trawlers were operating in nearby waters and landing their catches fresh. Those landings and those from the local canoe fisheries are marketed almost entirely in the Monrovia area.

Another aspect of the Liberian fisheries that was about ready to start was the landing and transshipment of tuna at the new freezer-storage plant in Monrovia. In cooperation

with a United States tuna packer, the freezer plant will handle frozen tuna landed by vessels of the Republic of China (Nationalist Chinese) and Spain which are under contract to the United States tuna packer. The first of such landings were to start early in June. While most of the tuna will be frozen at sea, provision has been made to brine-freeze up to 100 tons a day in the plant to handle tuna that may be landed iced but not frozen. It was expected that most of the tuna landed there would be by bait boats.

In its Annual Report for 1963, the Liberian Bureau of Fisheries stated that there is an intense desire by local fishermen to increase

### Liberia (Contd.):

their skill and knowledge so that they could increase their catches. This was evidenced in their mechanization of canoes with out-board motors. Recommendations made by the Liberian Bureau of Fisheries in its Annual Report were:

1. That the indigenous canoe fishery be maintained and developed because it could be a source from which fish could be obtained cheaper. This fishery has practically gone out of business since the trawlers began their operations. A means could also be found to better equip them by: (a) Putting synthetic materials--nylon, orlon and other synthetic lines and netting--at their disposal through the aid of the Government. (b) Introduce out-board motors in the local Liberian fisheries. (c) Set a reservation for this small canoe fisheries near the coastal area within the three-mile limit and prohibit all trawlers from trawling there. (d) Organize fishermen's co-operatives. (e) Organize the marketing and distribution system.

2. That the Liberian Bureau of Fisheries be equipped to instruct local fishermen in the greater variety of fishing techniques. The Bureau should have several different types of gear to demonstrate to interested fishermen who are keen to obtain the benefits of the new fishing methods. Such gear will include drift and set gill nets of different sizes, set and drift long lines, commercial trolling with poles and power gurdies, etc.

3. That the Government should purchase at least 6 semi-Diesel engines ranging from 25 hp. to 50 hp., have boats built locally and install 3 engines in them and sell them to Liberian fishermen on a hired, purchase system basis.

4. That local fishing boat-building projects be encouraged in Liberia. To effect this important project a foreign ship builder should be employed by the Government either in the Bureau of Fisheries or elsewhere to teach Liberians how to build seaworthy fishing boats. Also to obtain scholarships for Liberians to study in Europe or in some foreign parts.

It should be noted that the Liberian Government has been operating on an "austerity" basis because of limited funds. Government finances are expected to be much improved

in about two years and the Liberian Bureau of Fisheries will receive additional funds at that time for properly carrying out its work. (Fisheries Attache, United States Embassy, Abidjan, June 5, 1964.)



### Mexico

#### "PILOT" FISHING PORT AT ALVARADO NEARS COMPLETION:

The "pilot" fishing port project at Alvarado on the Gulf of Mexico is scheduled to open in early September 1964. It will be administered by the Mexican National Development Bank for Cooperatives. The project is expected to expand and modernize the Mexican fishing industry. It was financed by a loan from the Netherlands Government to the Mexican Government. It has been stated that the amount of the loan now exceeds 100 million pesos (US\$8 million).

The project includes several activities. A major dredging operation begun in late 1962 at the edge of Laguna Alvarado has opened a channel for larger vessels and provided fill dirt for a port area of about 20-25 acres. A modern dock area has been built, and construction work is nearly completed on buildings to house cold-storage warehouses, a wholesale market area, and plants to freeze, can, and smoke fish and to manufacture fish meal. The port area will include dormitory space for fishermen, supply storage areas, and a small dry dock and repair area.

The major remaining task is installation of machinery. A number of large freezing units from England are the only items presently installed. It is believed that the remaining machinery is coming from the Netherlands. To bring added electrical power to the project, a new power line from the Dos Bocas power station near Veracruz is being installed.

The project also involves the construction of five modern trawlers in the Netherlands for the Alvarado fishing fleet. The first of the vessels, the Alvarado I, has been delivered and has been in use for several months. The vessels can be adapted to various methods of fishing, and are highly automated. Plans for further expansion of the Alvarado fleet will depend on the success of the first five vessels from the Netherlands. The facilities of the port will also be available to the many fishermen in the area who have their own vessels.

A third phase of the program is an exploratory survey of the fish potential of the area and a study of the best means of exploiting it. The trawler Alvarado I, which acts as a training vessel for local fishermen, has been making a survey of the fish stocks in various areas of the Gulf of Mexico, and has experimented with various fishing methods. The exploratory program has succeeded in locating commercial quantities of fish, including tuna, which were not previously sold on the local market. Various techniques of fishing which are useful elsewhere have been tried and modifications have been adopted. Exploratory work will continue for some time after the new port is opened.

Relatively few new permanent jobs will be created directly by the port project, as the new trawlers will have crews of only six, and the port will be highly automated. It is claimed, however, that the indirect effects will be of considerable importance. Fishermen in the area were formerly dependent on the demands of the immediate market for a limited variety of fresh fish. They now will have a means of disposing of their catch even during periods of reduced demand. Many fish caught but not previously used, such as sardines, can now be canned and marketed. Thus, even with no change in fishing techniques, the individual fisherman can improve his earnings. Proponents of the project claim

## Mexico (Contd.):

that such improvement will lead vessel owners to upgrade their equipment and thus gradually improve the fleet.

The people of Alvarado have high hopes for the project. One construction firm has plans to build 200 homes in the area. Other people are thinking in terms of secondary industries for the port, such as a company to produce tin cans, and small boat construction enterprises. Secondary developments, however, will depend on the success of the primary port project. (United States Consulate, Veracruz, June 1964.)



## Netherlands

## REORGANIZATION OF FISHING INDUSTRY PROPOSED:

The Netherlands must land some 250,000 metric tons of fishery products annually during 1968-1970, in order to meet that country's anticipated growing demand. This is the belief of a Government-appointed committee of representatives of employers and workers in the Dutch marine fishing industry. The needed landings represent an increase of from 20 to 25 percent over the present quantity of fishery products auctioned or handled in Dutch fishing ports.



The committee was set up in 1959 to study and report on the Dutch fishing industry. The

committee's report, submitted to the Netherlands Minister of Agriculture and Fisheries in February 1964, included the following recommendations:

1. A Government premium of Fl.350 (US\$97) per gross registered ton for the construction of 25 new trawlers to replace obsolete vessels in 4 years at a total cost of Fl.20 million (\$5.5 million).

2. A Government premium of Fl.500 (\$139) per gross registered ton for the construction of 100 shrimp vessels, also replacing obsolete units, at a total cost of Fl.12 million (\$3.3 million).

3. A Government subsidy of 10 percent of the auction price of certain types of fish so as to give the Dutch fishing industry a competitive chance in the European Economic Community.

4. Credit facilities of Fl.12 million (\$3.3 million) for the Dutch fishing industry.

5. (a) Credit facilities of Fl. 7 million (\$1.9 million) annually for replacement of obsolete fishing vessels.

(b) A thorough investigation into the prospects of fishing in other than the traditional Dutch fishing waters and protection of fish stocks in the traditional Dutch fishing waters.

(c) A thorough investigation into Dutch fishermen's working conditions.

The Dutch Government has already decided to carry out the last point of the recommendations. (United States Embassy, The Hague, March 7, 1964.)



## New Zealand

## LOCAL SPERM WHALING PROMISING IN EARLY 1964:

Sperm whaling in New Zealand appeared promising, announced New Zealand's Marine Minister early this year. Since an experimental season under special license began in mid-January, a firm of the Whekenur whaling station in Queen Charlotte Sound, had taken 45 sperm whales in the first few months of 1964. The whale catch had totaled 168 since the taking of sperm whales started in May 1963.

## New Zealand (Contd.):

"The development of this industry and the investigations to determine the most appropriate time for an open season, are cooperative ventures by the Marine Department and the private fishing firm. The Navy and Air departments and the Royal New Zealand Air Force have helped by providing sperm whale spotting services," the Minister said.

The development of the sperm whaling industry had been forced on New Zealand because of the collapse of the humpback whale population as a result of excessive whaling in the Antarctic regions.

In 1963, the International Whaling Commission to which New Zealand belonged, prohibited the taking of humpback in the Southern Hemisphere. The New Zealand Government proposed to amend current legislation to provide for this prohibition. The only other known whaling stock around the New Zealand coast was a relatively small population of bryde or sei whales off the Hauraki Gulf. The prospects of further expansion beyond the area of exploitation could be based only on sperm whales of a different population to that being caught--from another land station. (The Fishing News, March 26, 1964.)



## Nigeria

### SHRIMP RESOURCES PROMISING:

Shrimp landings from Nigerian waters during June 1964 have indicated that the coastal waters of Nigeria may contain substantial shrimp resources which could be profitably exploited by experienced shrimp fishermen using efficient gear and vessels. The presence of commercial quantities of shrimp in those waters had not previously been demonstrated.

A fishing cooperative in Lagos, assisted by a fisheries adviser of the U. S. Agency for International Development (USAID), tried an American-built shrimp net for the first time in waters 12 to 20 miles south to southeast of Lagos harbor. The vessel used was an 80-foot trawler (180 hp.) towing a 60-foot Biloxi semi-balloon shrimpnet. A Food and Agriculture Organization (FAO) gear specialist was aboard the vessel. The first trip in 3 days of fishing netted about 1,000 pounds

of shrimp (probably white *Penaeus setiferus*) averaging 21-25 count (heads-off). A "tickler chain" was added and production increased to 2,000 pounds in 3 days, representing about 15 two-hour tows. It is probable that a more experienced crew, and a vessel using two nets, could increase this catch substantially. The depth of water in the area covered was 14 to 16 fathoms. Fishing was conducted both day and night, with catches by day somewhat better than those at night. Substantial quantities of mixed fish (including sole, croaker, and sardine) were caught along with the shrimp. More than 75 percent of the shrimp caught have been 21-25 count (heads-off), with smaller quantities of 16-20 and 26-30 count.

The cooperative is marketing the shrimp in the Lagos and the western Nigeria area through Nigerian market traders, major food distributing companies, and its own refrigerated trucks. Small quantities are deheaded, deveined, and packaged in one-pound packages for the department store trade. Samples have been flown to Barcelona, Spain, and successfully marketed there. In the Lagos market, the cooperative's current selling price is about 7 shillings (98 U.S. cents) a pound for the peeled and deveined product.

Plans are under way for further work with two shrimp nets of larger size, also ordered from the United States. Although the Continental Shelf is narrow along the Nigerian coast, the coast line is some 500 miles long. (U. S. Embassy, Lagos, July 11, 1964.)



## Norway

### EXPORTS OF CANNED FISH, JANUARY 1-APRIL 13, 1964:

Norway's total exports of canned fish during January 1-April 11, 1964, were down 5.8 percent from those in the same period of 1963. Shipments of canned small sild dropped 17.7 percent and those of kippered herring were down 16.6 percent. But shipments of canned brisling increased 10.7 percent from the same period a year earlier, and there were some increases in the exports of several other canned fish products.

The packing of sild started in early May. Small sild ran to relatively large fish this year and were suitable for packing only as sild-sardine. Packing of brisling started on

## Norway (Contd.):

Norwegian Exports of Canned Fish			
Product	1/1-1-4/11	1/1-4/13	
	1964	1963	
	. . . . . (Metric Tons) . . . . .		
Brisling . . . . .	1,757	1,587	
Small sild, smoked . . . . .	3,530	4,287	
Kipperd herring . . . . .	822	986	
Soft herring roe . . . . .	332	104	
Sild delicatessen . . . . .	131	121	
Fish dinner foods . . . . .	180	210	
Shellfish . . . . .	503	408	
Total . . . . .	7,255	7,703	
1/Preliminary.			

June 1. Norwegian canners and brisling fishermen had reached an agreement on the brisling price for the 1964 season. (Norwegian Canners Export Journal, May 1964.)

\* \* \* \* \*

FISHERIES TRENDS, MAY 1964:

Fisheries Price Supports: Negotiators for the Norwegian Government and representatives of the Norwegian Fishermen's Association have agreed on increased Government supports for the fishing industry during the next two years. The agreement, if approved by the Norwegian Parliament, will raise direct fishery price support funds from Kr.85 million (US\$11.9 million) to Kr.90 million (\$12.6 million) per year; grant a lump sum of Kr.10 million (\$1.4 million) to a new social fund that will partly cover the costs of social insurance plans for fishermen; and provide Kr.5 million (\$0.7 million) per year to assist in modernization of fishing fleets. In addition, the new agreement would increase the annual costs of the fisheries subsidy program (excluding some small boat and equipment subsidies) by Kr.20 million (\$2.8 million), or about 23.5 percent a year. The fisheries support increases, if approved by Parliament, will result in about the same income gain for fishermen as was granted wage earners in May 1964 by the Norwegian State Arbitration Board.

Norway to Participate in Indian Fisheries

Institute: On the request of the United Nations Food and Agriculture Organization (FAO), Norway will participate in establishing and operating a fisheries training institute in Bombay, India. The Institute is designed to train university graduates in fisheries administration. It will take qualified candidates from various countries in South-east Asia as well as from India. The Norwegian Agency for International Development has concluded a contract to take over FAO's

responsibilities in the project. Norway will provide an advisor to the Indian-appointed director of the Institute, a professor in fishery technology, and a professor in fishery economy. Norway will also supply a 40-foot fishing vessel, fully equipped, as well as scientific and other equipment for laboratories, workshops, and a library. Norway's contribution will be supplemented by financing from the Indian Government and the United Nations Special Fund. (United States Embassy, Oslo, June 9, 1964.)

\* \* \* \* \*

STERN TRAWLER DESIGN  
PRODUCED BY COMPUTER:

By feeding a computer with relevant facts about fishing vessel operation, a stern trawler design was produced. According to the facts revealed by the computer, 14 vessels built according to the design would be able to outfish 18 trawlers and 10 or 12 long-liners.

This was the conclusion reached by a Norwegian firm which was asked in August 1964 by a Hammerfest, Norway, fish-freezing firm to design a trawler to suit the freezing company's requirements.

The design consultants fed an electronic data handling machine with a series of facts, including catch results, weather conditions, the occurrences of fish on the grounds and during which seasons, and comparative figures on processing on shore and at sea. With this, and other information, it was able to deduce from the machine the average value per pound of catch landed over a year of 330 working days. Three designs (for a 300-, 400-, and 500-gross-ton vessel) were produced, and the machine calculated that the 400-ton vessel would produce fish slightly cheaper than the 500-ton one. However, it was decided that the 500-ton vessel would prove most suitable as it would produce more fish in the slack season and would land the greatest total during the year.

A director of the firm of consultants said that 14 of the 500-ton stern trawlers would supply the fish-freezing firm's present demands. At present that firm uses 18 trawlers and 10 or 12 long-liners to achieve the results forecast for the 14 stern trawlers.

Other facts produced by the computer included the speed of the vessel--12 knots; a 24-hour tie-up between trips; and a cargo capacity of 116 tons of boxed fish.

## Norway (Contd.):

The computer also produced statistics which indicated the best grounds on which the vessels should work at given times of the year. They will operate most profitably if they work off Western Finnmark in January and February, off Eastern Finnmark in March, at Bear Island during the following 4 or 5 months, and in Spitzbergen waters during the remaining part of the year. The daily income of each vessel was electronically calculated at 1,814.11 kroner (about US\$254) for fish and 500 kroner (\$70) for meal and oil.

The machine's findings were checked with available statistics which had been obtained in practice and were found to be accurate. (World Fishing, April 1964.)

\* \* \* \* \*

#### FISHING FOR DOGFISH AND BASKING SHARK OFF GREAT BRITAIN TO BE CONTINUED:

Norwegian fishermen will be permitted to continue fishing for traditional dogfish (*Acanthis vulgaris*) and basking shark (*Cetorhinus maximus*) in certain defined area between 6 and 12 miles off the coast of Scotland until January 1, 1965. This will be in accordance with a proposal signed by the Norwegian and British delegations in the recent negotiations in London concerning the Norwegian fishery within the new 12-mile fishery boundary of Great Britain. The proposal will have to be approved by the two governments before coming into effect.

Until January 1, 1985, the Norwegian dogfish fishery may take place in the areas between 6 and 12 miles off the coasts of the Flannan Islands, the Shetland Islands, the Fair Isle, the St. Kilda Group, North Rona, Sulisker, Sule Skerry, and Stack Skerry. The basking shark fishery may be carried on in the same areas and, in addition, in the area between Runair in the Hebrides and Mull of Oa on the Islay Island.

Norwegian fishermen will further be permitted to carry on their dogfish and basking shark fisheries between 3 and 6 miles off the coasts of the defined islands until January 1, 1966.

At the London negotiations the delegations further agreed to include a most-favored-nation clause in the treaty securing Norway the same rights to fish for dogfish and basking shark in the defined areas as might be extended to third countries.

Jurisdiction over the fisheries in the period of transition will be based on the North Sea Convention of 1882 or on possible other international agreements signed by Norway and Great Britain during the period. As far as fish conservation measures are concerned, Great Britain cannot impose any regulations limiting the Norwegian rights in the period covered by the agreement without the consent of the Norwegian Government.

Judged by the reaction voiced through the press, it was considered that the Norwegian delegation obtained satisfactory results for the fishing interests of its country. Norwegian fishing off the coast of Great Britain has traditionally largely been limited to dogfish and basking shark in the areas covered by the agreement. To compensate for the rights granted to Great Britain for fishing in the areas between 6 and 12 miles off the entire coast of Norway for 10 years,

the corresponding Norwegian rights in the waters of Great Britain have been extended to 20 years. (United States Embassy, Oslo, July 19, 1964.)

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#### SEALING EXPEDITION TO THE ANTARCTIC:

A sealing expedition to the Antarctic left Bergen, Norway, July 18, 1964. The main purpose of the expedition, the first Norway has sent to the Antarctic in this century, is to survey the possibility of large-scale sealing in those waters. The expedition which is sponsored by a Bergen manufacturing and trading firm, consists of the sealing vessel Polarhav and one helicopter. Studies of the Antarctic seal herds will be conducted by a scientist from the Norwegian Ocean Research Institute in Bergen.

The search for new hunting grounds for Norwegian sealing is a reflection of the diminishing stocks of seals in traditional hunting areas in the Northern Hemisphere, according to the Norwegian firm sponsoring the expedition. (United States Embassy, Oslo, July 21, 1964.)



#### Panama

##### SHRIMP FISHERY TRENDS, 1963:

Panama's shrimp production in 1963 fell almost one million pounds short of the record 1962 mark, despite the fact that there was a greater number of vessels operating. The Fisheries Office reports a total catch of 12,309,714 pounds, compared with 13,284,031 pounds in 1962. The 1963 production compares more favorably with production prior to 1962, and actually exceeding the previous peak year of 1961 by almost 200,000 pounds.

Table 1 - Panama's Shrimp Production (Heads-off with shell), 1961-1963

Species	1963	1962	1961
		(1,000 Lbs.)	
White . . . . .	3,463	4,558	4,625
Pink . . . . .	2,901	3,402	2,586
Titi . . . . .	5,287	4,814	4,444
Tiger . . . . .	659	510	461
Total . . . . .	12,310	13,284	12,116

Production of the small titi and tiger shrimp rose during 1963 by 473,209 pounds and 148,737 pounds, respectively. Those gains were more than offset by a drop of 500,955 pounds in the pink shrimp catch and a more serious decrease of 1,095,297 pounds in the catch of the premium-priced white shrimp. Industry sources believe that the normal rise and ebb of the shrimp supply can account for some of the decline in production, but also contend that there have been too many vessels operating in recent years, which has resulted in over-fishing.



## Panama (Contd.)

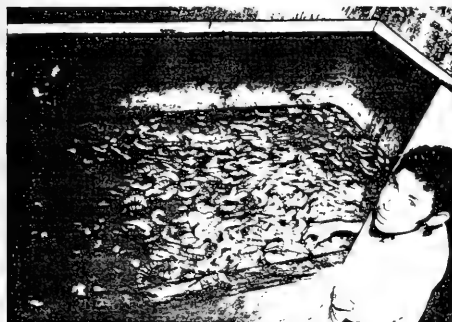


Fig. 1 - Shrimp in a brine-freezer tank aboard a Panamanian shrimp trawler.

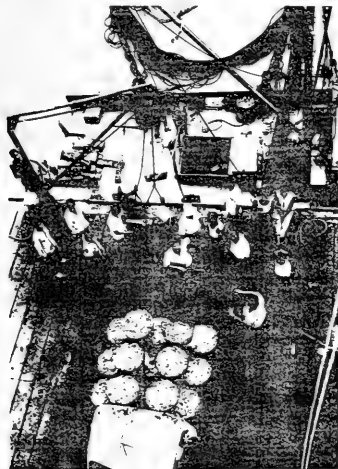


Fig. 2 - Unloading a shrimp trawler at a pier in Panama City.

Despite the existence of legislation restricting the number of shrimp vessels to 160, there were as many as 210 vessels operating in 1963. The source of illegal licensing has apparently been uncovered, however, and the Fisheries Office has stated that the practice has stopped.

The shrimp industry, although set back by a combination of lower production and falling prices in 1963, remains financially strong, and the outlook for 1964 is optimistic. Modernization of vessels and equipment is continuing. Production in the early months of 1964 was reported ahead of 1963.

As in the past, the entire shrimp catch, with the exception of minor local sales, was exported to the United States. A combination of lower prices and the considerable decline in the premium-priced white shrimp catch resulted in the f.o.b. value of Panama's 1963 shrimp exports tumbling more than

23 percent from the record mark of 1962. Total f.o.b. value for 1963 exports was US\$6.08 million as compared to \$7.94 million for 1962 exports.

Table 2 - Value (f.o.b.) of Panama's Shrimp Exports, 1958-1963

	Million US\$
1963 . . . . .	6.08
1962 . . . . .	7.94
1961 . . . . .	5.85
1960 . . . . .	4.99
1959 . . . . .	5.10
1958 . . . . .	5.61

The bulk of Panama's shrimp catch is transported by sea. Processing is limited to peeling, removing the sand vein, and then packing for shipment. The more than adequate sea transportation facilities are a positive factor for Panama's shrimp industry. One firm, located in Chiriqui Province near the Costa Rican border, does fly its production to Miami. (United States Embassy, Panama, June 2, 1964.)

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### SPINY LOBSTER AND SCALLOP FISHERIES:

A small number of spiny lobsters are taken in Panama, each year in the Bocas del Toro area on the Atlantic Coast, but no expansion of that operation is contemplated. Optimism for a much larger spiny lobster industry and for the development of a scallop industry, that blossomed for a time in 1963, seems to have disappeared completely.

The Bocas del Toro spiny lobster production in 1963 amounted to about 75,000 pounds, according to an unofficial estimate from the Fisheries Office. Some of that production was flown in small shipments to the United States, with the balance marketed in Panama.

Beginning in June of 1962, an exploratory program was undertaken, with USAID financing, to determine the potential for commercial exploitation of spiny lobsters in Panama's coastal waters. The program was extended in June 1963, but finally cancelled in December 1963. In the opinion of USAID, there was not sufficient interest shown by the Panamanian fish industry to justify further research.

The survey did produce a few promising signs. A few individuals have since made some limited, but as yet unsuccessful, attempts to further explore the commercial possibilities of spiny lobster fishing in the Gulf of Panama. It is the contention of at least one authoritative source in the industry, however, that, while there might be some possibilities for successful exploitation on a very small scale, there was nothing in the survey's findings to justify any hopes for a large-scale operation.

One unexpected development of the spiny lobster survey was the discovery, in September 1963, of large beds of scallops in the Gulf of Panama. One of Panama's largest shrimp firms attempted to capitalize on that finding and met with some initial success, harvesting 50,000 pounds in the period of a few months. Sharply dropping prices rendered further efforts unprofitable, however, and no further attempts have been made to exploit that fishery. The scallops taken were small by comparison with United States scallops. From an original price of 65 cents a pound, f.o.b. Panama, the price dropped in a few months to a point where the wholesale price in New York was 52 cents a pound. Attempts to open European markets were unsuccessful. In the opinion of the firm's manager, there is no doubt that the beds discovered are extremely extensive; but, based on the firm's experience, he does not believe that commercial exploitation is feasible, at least not if shrimp vessels with their expensive overhead are used to harvest the scallops. (United States Embassy, Panama, June 2, 1964.)



## Poland

### FISHERY TRENDS IN 1964:

"Gryf" Deep-Sea Fishery of Szczecin started operating its first "B-23"-type freezer stern-trawler, the Barwena, at the beginning of April.

By the end of April 1964, the sprat fishing season in the Baltic had commenced. This year's season (different from former seasons) saw dense sprat shoals in the open waters of the South Baltic, and none in the Bay of Gdansk.

In the years 1966-1970, fisheries will receive from Gdansk Shipyard more vessels than it was assumed. One enterprise will receive 19 factory-trawlers of the "B-15"-type as against the planned 15 units.

In the years 1966-1970, the funds to be spent for the extension of cold-storage plants, ports, fish meal factories, ice factories, etc. will total 1,148 million zloty, whereas only about 600 million zloty were allotted for this purpose in the years 1961-1965. (Polish Maritime News, June 1964.)

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### FISHERIES TRENDS AND EXPORTS IN 1963:

Poland's fishing industry and processing of fishery products were expanded in 1963 as a result of new investments which boosted that country's fishery economy. Poland, formerly an importer of fishery products, has become an exporting country. One large Polish import-export firm traded with a growing number of foreign countries in 1963, and has been increasing both its foreign trade and variety of fishery products for export.

In 1963, Poland exported 1,700 metric tons of fresh, frozen, or live fish, 390 tons of smoked fish, 3,500 tons of canned fish, and a smaller quantity of salted fish.

Exports of fresh-water fish, most of which are live, wet, or frozen, consisted mainly of eels, carp, perch, and pike. Eels from Poland have become especially popular in foreign markets. Poland's eel production has increased considerably because of its stocking program in reservoirs. In 1963, a total of more than 600 tons was exported.

Despite the abundance of carp found in most European markets, the foreign demand for Pol-

ish carp is very good because of its high quality and the fine texture of the meat. This is reported probably due to the care exercised in the rearing of carp in Poland and the supplements added to their natural food.

The leading and most valuable item in frozen fish exports is salmon, which is sold either for direct consumption or for further processing (smoking). Polish salmon, in particular, the so-called "Vistula" salmon, are highly regarded in foreign markets because of its excellent flavor and good preparation. Poland's exports of smoked fish are relatively new. Initiated in 1961, exports of twice cold-smoked her-



A Polish fish-canning plant in Gdynia. Preparing herring for hot smoking.

ring and herring fillets reached 390 tons in 1963. The production of smoked fish by fish-processing plants in Gdynia and Koszalin is done with modern techniques consisting of a tunnel system for drying soaked salted herring and for their smoking afterwards in large chambers or tower ovens. Twice cold-smoked herring are delivered to receivers in wooden cases (contents of each being 6.8 kilos or about 15 pounds). Herring fillets are packed in plastic bags (contents 140 grams or about 5 ounces) containing 30 bags each.

Canned fish is the leading item in Poland's fishery products exports. They are packed by special state-owned and cooperative factories located at the sea fisheries ports of Gdynia, Gdansk Leba, Ustka, Szczecin, Swinoujscie, and other ports, as well as in the lakes regions or in pond fish-breeding centers such as Giezko, Chojnice and Krakow. In 1963, technical-organizational improvements were made in several canning factories with a view to increasing the quantity and enlarging the variety of species packed, as well as to attaining uniform standards of high quality.

Special stress has been laid on the problem of mechanizing production, modernizing the

## Poland (Contd.):

machines, and introducing the latest methods of production technology. As a result of providing the factories with such up-to-date arrangements as tunnels for continuous mechanical evaporating of fish, heaters, sauce homogenizers, colloidal sauce and pie mills, mechanical sprat sorters and automatic sprat wire threading machines (for smoking), it was possible to arrange special production lines in those canning factories. This resulted in greater production capacities and the attainment of a more uniform and larger variety of canned fishery products suitable for transporting and storing even under tropical conditions.

Poland's most outstanding modernizing work was completed in 1963 at a fish processing plant in Gdansk. As a result, the production of canned fish there rose by nearly 100 percent, up to 3,000 tons a year. Modernization was also initiated in Poland's largest fish-processing factory at Gdynia. After its completion, that factory's output is expected to increase by nearly 70 percent to 5,000 tons of canned fish a year. There will also be a corresponding growth in that plant's production for export.

A wide variety of fishery products offered and supplied by Polish fish canneries to nearly 30 countries throughout the world include such products as sprats in oil, brisling in oil, sild sardines, fish-liver paste, herring in oil, cod liver (in own sauce), mackerel in tomatoes, herring in tomatoes, flounder in tomatoes, stuffed carp, sprats in spicy oil, bream in tomatoes, herring and mackerel fillets in various sauces, eel in oil, and various other fishery specialties of the hors d'oeuvre type. They are packed in various size cans (round, oval, rectangular, etc.) with net weight of the contents ranging from about 3 ounces to nearly 1 pound.

Polish fish-processing plants adjust their production to the actual requirements of their customers and try to fill their export orders to exact specifications.

In 1963, Poland started selling and delivering fish to West African ports by vessels operating in central Atlantic fishing grounds. Polish fishing units operating in that region found a good market potential in Nigeria and Ghana. In 1963, the Polish Board of Fishing Industry delivered several thousand tons of

fish, both frozen and wet, to markets in West Africa. Species included red snapper, horse mackerel, and mackerel. The demand for fish in West African countries is considered very good and the Polish fishing industry believes it is possible to increase such exports considerably.

The Polish fishing economy in 1963, with respect to production and exports was considered, on the whole, as prosperous and profitable. The Polish fishing industry was believed to have made good progress during 1963 in meeting its long-range goal of placing Poland among the leading European producers of fishery products. In addition to increased fishery landings and greater output of processed fishery products in 1963, progress was seen in the improved quality of products offered for export. (Polish Maritime News, June 7-12, 1964.)

Note: See Commercial Fisheries Review, June 1964 p. 55, March 1964 p. 66, February 1963 p. 86.

\* \* \* \* \*

## FISH MEAL PRODUCTION, 1963:

Polish factory-trawlers in 1963 produced 2,257 tons of fish meal, while factories ashore manufactured 4,720 tons of fish meal and 2,851 tons of fish "pulp."

According to this year's target, factory-trawlers are to produce 3,930 tons of fish meal, factories ashore to manufacture 3,770 tons of fish meal and 3,020 tons of fish "pulp." (Polish Maritime News, June 1964.)



## Portugal

CANNED FISH EXPORTS,  
JANUARY-MARCH 1964:

Portugal's total exports of canned fish in oil or sauce during the first quarter of 1964 were at the same quantity level as in the same period of 1963. Sardines accounted for 81 percent of the total canned fish exports in the first quarter of 1964, followed by anchovy fillets with 7 percent, mackerel 5 percent, and chinchards 4 percent.

The canned sardine exports in January-March 1964 were up 3 percent from the same quarter in 1963 and exports of chinchards were double those of a year earlier. Exports of canned mackerel for the period were 36 percent

## Portugal (Contd.):

lower than in 1963 and those for anchovy fillets dropped 24 percent from the same period a year earlier.

Portuguese Canned Fish Exports, January-March 1963-64				
Product	January-March			
	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	14,055	739	13,607	716
Chinchards	674	35	331	17
Mackerel	878	34	1,361	54
Tuna and tuna-like	360	11	457	15
Anchovy fillets	1,138	114	1,506	151
Others	245	12	70	4
Total	17,350	945	17,332	957

Portugal's principal canned fish buyers during the first quarter of 1964 were Germany with 3,238 metric tons, followed by the United Kingdom with 2,333 tons, France 2,316 tons, the United States 1,788 tons, Italy 1,497 tons, and Belgium-Luxembourg 1,280 tons. Germany's 1964 purchases of canned fish from Portugal increased 25 percent from those in the same period of 1963, the United Kingdom up 21 percent, and France up 40 percent. Purchases by the United States and Italy were down 19 and 42 percent, respectively, from the same period in 1963. (Conservas de Peixe, May 1964.)

\* \* \* \* \*

CANNED FISH PACK,  
JANUARY-MARCH 1964:

Portugal's total pack of canned fish in oil or sauce for the first quarter of 1964 was up 123 percent as compared with the same period in 1963. The substantially increased pack over the same quarter in 1963 was mostly due to the large pack of sardines which accounted for 56 percent of the total January-March 1964 canned fish pack. The canned tuna pack was nearly five times greater than in the

Portuguese Canned Fish Pack, January-March 1963-64				
Product	January-March			
	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	3,358	177	1,177	62
Chinchards	225	11	9	-
Mackerel	198	8	32	1
Tuna and tuna-like	998	33	178	6
Anchovy fillets	1,008	101	1,289	128
Others	218	11	13	-
Total	6,005	341	2,698	197

same period a year earlier, and the chinchard pack was up sharply from the same period in 1963. (Conservas de Peixe, May 1964.)



## South Africa Republic

EXPLORATORY FISHING FOR SHRIMP  
OFF WEST COAST:

Since December 1963, the Fisheries Development Corporation of South Africa, in co-operation with the trawling industry, has carried out experimental fishing for shrimp off the Cape west coast and on the Agulhas Bank. The vessel used is the 67-foot stern trawler *Keurbooms*, owned by a South African fishery firm.

A 75-foot shrimp trawl was imported specially for this operation; a 100-foot trawl was ordered; and a 15-foot reversible beam trawl has also been tested.

Early results indicate that night fishing has produced the best catches of shrimp. Three species have been taken in the nets, and while initial catches have been small, the results are reported to be encouraging. (The South African Shipping News and Fishing Industry Review, May 1964.)

\* \* \* \* \*

ANCHOVY RESOURCES OFF  
COAST EXPLORED:

Because of the need to vary the South African fishing effort and thus reduce the dangerous dependence on a few species, a carefully planned experiment in anchovy fishing was initiated late last year by the Fisheries Development Corporation in association with the Division of Sea Fisheries and the fish meal industry. Six special purse-seine nets were imported and were supplied to six vessels provided by the industry.

Fishing started in October and early November 1963 and the work was coordinated by a Corporation technologist.

Until the end of December the following vessels fished the shoals of anchovy (*Engraulis japonicus*):

Between Lambert's Bay and Dassen Island-Groenveld II and Leerdam; between Dassen Island and Cape Hangklip--Kruger and Brand; from Cape Hangklip east--Vleijens and Secagans. All of them are large modern pilchard vessels in the charge of experienced skippers. They used (in conjunction with power blocks) knotless nets of synthetic fiber each about 200 fathoms long and 25 fathoms deep with a half-inch mesh (stretched).

Numerous technical problems were encountered, and it was only in December that fish were taken in any quantity. The total catch in that test period was 1,050 short tons, made up of 410 tons of anchovy, 465 tons of pilchards, 132 tons of round herring, and 45 tons of maasbanker. Four-fifths of the anchovy were caught in December and nine-

## South Africa Republic (Contd.):

tenths of the 410-ton catch were obtained off the coast of the Cape Peninsula between about Llandudno and Cape Point. The remaining one-tenth was obtained mainly in the area between Saldanha Bay and Lambert's Bay. The length of the anchovy was between 3 and 5-1/2 inches with an average of 4 inches.

At the start of the seven-months' Cape pilchard season in January the six vessels resumed normal fishing for their factories. Five of the nets were distributed to factories along the coast to be used whenever possible. The sixth net was taken by the 61-foot vessel Karin, which was made available to the Corporation. The vessel was prepared for anchovy fishing. Again, technical problems disrupted fishing and by the end of March the tests, while they revealed the presence of anchovy, had yet to show whether the fish could be caught in quantities sufficient to support an industry.

Then one of the fishing firms which had one of the anchovy nets made some modifications to it. Reports from other factories had mentioned the difficulty of retrieving the deep net once it had been cast. The company had also heard from fishermen that anchovy could be seen near the surface. This gave them the idea that the special net might be too deep and it was, therefore, adjusted to about 20 fathoms.

Carrying this net with an unbraided nylon rope as a purse line, one of the firm's skippers sailed at about 11 a.m. on April 9 in the 67-foot pilchard vessel Silver Bonita. After 80 minutes' sailing north of the factory, anchovy shoals were seen on the echo-recorder. The first cast was successfully brought in with 60 tons of anchovy of a very small size.

On April 10 the Silver Bonita set out at 10 a.m. and proceeded north for two hours before the echo-recorder revealed fish. The first cast yielded 60 tons of anchovy at about 12 noon. A second cast at about 5 p.m. gave 100 tons. The fish were slightly larger than those caught the previous day.

On April 12 the boat left the factory in the evening and found fish in about the same position as before. This was the first attempt at night fishing and, although the vessel returned early next morning with 120 tons of anchovy, five casts had to be made.

On April 13 the vessel set out at 11 a.m. and returned at 6 p.m., because of bad weather, with 70 tons of anchovy taken in one cast.

By the third week of April the Silver Bonita had taken just over 800 tons. All her catches were satisfactorily processed in the firm's fish meal plant. Oil yield was high and the meal, slightly darker than that obtained from pilchards, was of good quality.

While the Silver Bonita was taking her catches, other boats had joined in the search. This was necessarily limited in scope because of the small number of anchovy nets available. One of those was used by the 70-foot vessel Groenveld II, fishing for a canning company. In three days this large vessel caught 300 tons of anchovy. By the third week in April she had brought in 540 tons.

Operating for still another firm, the Renosterkop brought in 390 tons. The Kruger and the Brand, operating for a Hout Bay firm, caught about 350 tons.

In less than three weeks in April, therefore, more than 2,000 tons of anchovy were caught.

Encouraged by this success and its implications, the Corporation and the industry have decided to move into the second stage of the experiment. It was agreed last year that, if the signs were favorable, fishing would be extended by the purchase of more nets. These are now being ordered and the first was to arrive in June 1964.

Twenty-three more nets are to be bought at a cost of about R8,000 (US\$11,160) each, and, with the Karin, 29 vessels were expected to be engaged in anchovy fishing within the next 3 or 4 months.

According to the general manager of the Corporation, the vessels will be allowed by the Director of Sea Fisheries to continue fishing after the close of the pilchard season at the end of July. This will be an industry venture controlled and coordinated by the Corporation. (The South African Shipping News and Fishing Industry, May 1964.)

\* \* \* \* \*

## FISH MEAL PRODUCTION FOR 1964 SOLD OR COMMITTED:

Prospects for South African fish meal appear very good, according to the Chairman of the South African Fish Meal Producers' Association. He made this statement when he visited Walvis Bay the last week of March 1964 with a 13-man Japanese delegation on a world tour.

About 75 percent of the total South African fish meal production (which includes South-West Africa) had been sold. The balance, for which the industry was already committed, would be sold later in the year.

The estimated South and South-West African production this year is about 300,000 short tons. The main markets for South African fish meal continue to be the United Kingdom, the Continent, the United States, and Japan.

Japan, he said, had signed a contract for 30,000 tons this season, the first shipment of which was scheduled in April 1964.

Speaking about the Japanese delegation, he said that its members represented the main feed buyers in their country.

"As a result of the talks we have had with the delegation," he said, "it is quite possible that Japan will purchase substantially more fish meal in 1965. . . ." (The South African Shipping News and Fishing Industry Review, May 1, 1964.)

\* \* \* \* \*

## SPINY LOBSTER FISHING REGULATIONS AMENDED:

The regulations for fishing spiny lobster in South African waters were amended on March 13, 1964, under Section 11 of the Sea Fisheries Act of 1940, as follows:

"No person shall land or bring ashore any Cape rock lobster or any part of any Cape

## South Africa Republic (Contd.):

rock lobster at any point along the coast of the Cape Peninsula in the area between, as northern limit, a white concrete beacon marked TBN1 situated near the mouth of the Second Salt River (also known as Diep River) and, as southern limit, a similar beacon marked H1 situated near 'Die Josie' at the southern extremity of Hout Bay:

"Provided that this regulation shall not apply to the landing or bringing ashore of Cape rock lobster at the fishing harbour, Table Bay Docks, as defined in Government Notice No. R290 of March 2, 1962 (regulations for the Harbours of the Republic of South Africa and South West Africa), or at the main landing quay at Hout Bay fishing harbour."

Police stations along the coast were notified of the new regulation and fishermen operating from Three Anchor Bay, a favorite landing place for spiny lobsters, were warned that they will be prosecuted if they continue to do so.

The new regulation was described as the latest blow to rock lobster poachers. Apart from that measure, no lobsters may be caught in the permanent sanctuary between Hout Bay and Salt River, which extends 12 miles seaward--the recently defined limit of South Africa's sea-fishing zone.

During the closed season (September 1 to October 31) there is a total ban on lobster fishing along the coast and at all times there is a limit to the size and condition of lobsters that may be caught.

According to the Director of Sea Fisheries, the sanctuary is most important from the point of view of conservation, situated as it is at the southernmost region of the total distribution of the species along the West Coast. He said: "It plays an extremely important role in restocking other areas along the West Coast..."

The new regulation seemed to stop the fishermen for a few days, but they were quick to see a loophole in the law. It was reported that men, manning boats equipped with outboard motors, which are not allowed in Table Bay Harbour and for which the distance to Hout Bay is too great, were transferring their lobsters to "mother" craft while still at sea and receiving cash on the spot. This,

however, may be a technical infringement of the new rule.

The following are some of the main regulations governing the catching of spiny lobster in Cape waters:

1. The body must be at least  $3\frac{1}{2}$  inches measured down the upper side of the shell from between the eyes to the rear end of the shell.
2. No one shall sell, expose for sale, purchase, possess, or be in possession of any spiny lobster tail which has been severed from the body, if the second segment of the tail from where it joined the body is less than  $15/16$ th of an inch long when measured from edge to edge down the middle line of the upper side of the tail.
3. It is illegal to catch, sell, expose for sale, purchase, or be in possession of female spiny lobster in berry (carrying eggs) or which show signs of having been stripped of the berry; or any spiny lobster which is about to or which has recently cast its shell or is "soft."
4. Spiny lobster must be landed whole and if inadvertently caught undersized, "soft," or in berry, shall be returned immediately to the sea.
5. The return of spiny lobster offal, or of any part of a spiny lobster to the sea, is prohibited except in a part of Table Bay to the northwest of a line drawn from the end of the breakwater to the beacon opposite Rietvlei; and the part of the territorial waters bounded by the coastline from York Point (or the Puntjie) to the mouth of Hout Bay River, and by a straight line drawn from the Hout Bay River mouth to York Point.
6. No one may, for commercial purposes, catch spiny lobster by diving or swimming underwater and no skipper or boat owner engaged in catching spiny lobster may carry or allow to be carried diving equipment of any description.
7. Any spiny lobster found on a boat carrying such equipment shall be deemed to have been caught by divers--until the contrary is proved.

Diving for spiny lobster not for commercial purposes is permissible subject to the following conditions:

## South Africa Republic (Contd.):

(a) For his own use, a diver may not take more than five spiny lobster a day--a permit not being necessary.

(b) A diver who wishes to collect spiny lobster on behalf of others for their own use must apply to the Director of Sea Fisheries for a permit, which will be for a quantity not exceeding 15 a day.

(c) No spiny lobster undersized, in berry, or "soft" may be taken and no diving may be done in any sanctuary or during the closed season.

(d) The spiny lobster caught may not be sold or offered for sale.

(e) A diver without a permit found with more than five spiny lobster, or one with a permit found with more than the authorized quantity shown on the permit, will be deemed to have contravened the law.

There are 5 spiny lobster sanctuaries off the Cape coast--Hout Bay, Table Bay, Robben Island, Saldanha, and St. Helena. The regulations listed apply only in the Cape and not in Natal, where diving for fish is controlled by the Natal Provincial Administration.

The penalty for a conviction under the Sea Fisheries Act is a fine not exceeding 200 Rand (about US\$279) or jail for a period not exceeding a year, or both. A further fine equivalent to the assessed monetary gain in consequence of the offense may be imposed. Fishing gear may be confiscated and in the case of a second or further conviction the boat used in committing the offense may be confiscated and the license cancelled. (The South African Shipping News and Fishing Industry Review, April 1964.)

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## QUALITY SPECIFICATIONS FOR FISHERY PRODUCTS:

The South African Bureau of Standards has been requested to prepare a specification for the oyster industry in South Africa. Although cultivation of oysters is one of the lesser known activities of the South African fishing industry, that industry envisions some measure of growth and development and is preparing to produce a quality product under the requirements of the Bureau of Standards.

The scope of the specification for oysters is expected to deal with good "farming" of the product, hygienic handling, treatment, size and weight grading, packaging, storage, and transportation. An important public safeguard will be the requirements dealing with pollution and contamination of the oyster beds as well as the oysters themselves. This will include the treatment necessary, and the exercise of control to protect the consumer by inspection and microbiological examination.

Quick frozen fishery products sold in South Africa are produced to the requirements of a standard specification of the South African Bureau of Standards. The emphasis is on hygiene--in the plant, the production line, employee working conditions, and for the employees themselves. Quality requirements for the raw product are strict and the characteristics that indicate absolute freshness are clearly defined in the specifications. (The South African Shipping News and Fishing Industry Review, March 1964.)

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## NEW VESSEL EQUIPPED FOR DRUM-TRAWL FISHING:

In May 1964, the new stern-trawler Scotia joined the Port Nolloth fleet of a South African fishing company. The 75-foot vessel does not have a stern ramp. It was designed, instead, to use the drum-trawl method of fishing which is widely practiced in the Pacific Northwest area of the United States. On the Scotia, a large drum has been fitted just over the stern between the legs of the gantry on the upper deck. The drum acts as a reel for the trawl net which is simply wound on to the drum or wound off for shooting. The cod end is lifted to the head of the gantry and then carried across by a derrick until it is over the fish storage hold. The trawl drum on the Scotia is cable-driven from the main trawl winch. The drum will be modified for hydraulic operation if it proves successful off South Africa. Drum trawling leaves a clear working deck at all times and the wheelhouse of the new vessel has been placed forward so there is ample working deck space.

Built in Durban, South Africa, the Scotia is equipped with a 3-cylinder, 2-stroke Diesel engine driving a single controllable-pitch propeller. During trials, top speed was  $9\frac{1}{2}$  knots. The vessel has a fuel capacity of 12 tons of Diesel oil and an operating range of 2,340 miles when traveling at a cruising speed of  $6\frac{1}{2}$

### South Africa Republic (Contd.):

knots. It has a hold capacity of 30 tons of fish and an equal quantity of ice. The hold is completely insulated with polyurethane foam.

Although intended primarily for bottom trawling, the *Scotia* was designed as a multi-purpose vessel and will also be used for spiny lobster fishing and for tuna long-lining. The vessel carries radar, radiotelephone, and echo-sounding equipment.

As the *Scotia* prepared to enter service in the spring of 1964, a sistership, the *Dunscore*, was nearing completion in a Durban shipyard. The design of both trawlers was planned with the aid of technicians who had observed European and United States fishing methods. (*The South African Shipping News and Fishing Industry Review*, May 1964.)



## South and South-West Africa

### FISHERY LANDINGS SET ANOTHER RECORD IN 1963:

The fishing industry of South and South-West Africa had its third million ton year in 1963, and for the sixth year in succession total landings set a new record. The fishing fleet of 1,000 powered boats and some 3,000 dinghies, operating from Durban to north of Walvis Bay, caught 1,248,230 short tons of pilchards, massabanker, mackerel, hake and other trawl fish, snoek and other line fish, and spiny lobster. It was the third year in a row that landings were over one million tons, nearly 100,000 tons above the record landings in 1962.



Fig. 1 - A 51-foot Walvis Bay, South-West Africa, vessel with a full catch of pilchards.

Since 1958, the South and South-West African fishing industry has enjoyed an unbroken succession of record landings. In 1958, total landings were 724,000 tons; in 1959--824,000;

1960--956,000; 1961--1,113,000; and in 1962--1,154,226 tons.

The new record in landings was achieved despite a drop in the Cape landings of pelagic shoal fish and a further slight decline in landings of trawl fish. But the difference was more than made up by a very large increase in the pilchard quota allowed the 6 factories at Walvis Bay.

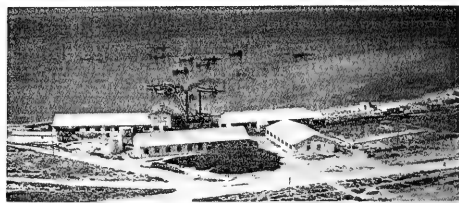


Fig. 2 - A pilchard-maasbanker cannery and reduction plant on the St. Helena Bay coast.

In the seven-months pilchard fishing season from January to the end of July, Cape fishing boats caught 441,943 short tons. In the same period in 1962, pilchard landings totaled 452,735 tons.

During the seven months, Cape boats also fished for maasbanker and mackerel. They were permitted another short season for those fish in November and December which brought the totals to 26,400 tons of maasbanker and 14,824 tons of mackerel, both well below the 1962 landings. The total pelagic shoal fish landings for the Cape in 1963 eventually reached 483,167 tons as compared with 550,233 tons in 1962 and 545,081 tons in 1961.



Fig. 3 - Part of the Cape Town fleet engaged in the South African spiny lobster fishery.



### South and South-West Africa (Contd.):

In Walvis Bay the pilchard quota was raised again, this time from 435,000 tons in 1962 to 540,000 tons and later to 600,000 tons. The final landings of 602,639 tons compared with 435,068 tons in 1962 and with 377,281 tons in 1961. Added to the figure for Cape shoal fish, this increased catch at Walvis Bay raised the total for shoal fish in South and South-West Africa from 986,301 tons in 1962 to 1,085,806 tons in 1963.



Fig. 4 - A spiny lobster plant at Hout Bay, near Cape Town, which processes and exports frozen spiny lobster tails to the United States.

With a seventh factory scheduled to go into operation at Walvis Bay in mid-1964 and a new fish meal factory going up at Luderitz, the permitted limit for South-West African pilchards has been raised to 720,000 tons in 1964. If the Cape catch fulfills its early promise, the increase in South-West Africa may combine with it to set a further new record for shoal fish in 1964.

For the South African trawling industry, 1963 was an average year with the total land-



Fig. 5 - A large otter trawler at Cape Town, typical of the fleet that fishes for stockfish.

ings slightly below those of 1962. According to the Division of Sea Fisheries, those landings totaled 224.9 million pounds valued at US\$7.2 million. In 1962, landings by the South African trawling industry were 117,925 tons.

No statistics are kept by the South African Government of spiny lobsters caught for local sale or of line fish landed at the numerous harbors, large and small, along the South African coast. The Division of Sea Fisheries estimates, however, that the Cape spiny lobster catch was about 9,000 tons and the Cape and Natal line fish catch was about 30,000 tons.

In South-West Africa a catch of 6,500 tons of spiny lobster was estimated, together with 3,000 tons of white fish and 1,500 tons of snoek. (The South African Shipping News and Fishing Industry Review, March 1964.)



## Republic of Togo

### EXTENDS TERRITORIAL WATERS TO 12 MILES:

A law regulating commercial fishing in the Republic of Togo, also extends Togolese territorial waters to a limit of 12 nautical miles (measured from extreme low tide). The law was passed on July 2, 1964, by the Togolese National Assembly. The law regulates commercial fishing in Togo's inland waters as well as ocean waters, and reserves fishing in territorial waters to Togolese citizens with no provision made for exceptions or licenses.

Fishing within the 12-mile limit is prohibited to foreign vessels, and the law provides severe penalties for violations, including confinement for up to 5 years and possible seizure of vessels and catch. The conditions of the law do not affect the free circulation of foreign fishing vessels navigating or anchoring in Togolese territorial waters. (United States Embassy, Lome, July 14, 1964.)



## U.S.S.R.

### NEW VARIETY OF STURGEON DEVELOPED:

A new variety of sturgeon which does not leave for the sea after spawning has been developed by Soviet scientists. One of the

### U.S.S.R. (Contd.):

U.S.S.R. scientists believe that in 10 to 15 years time it will be possible to keep large sturgeon shoals in any reservoir. This is considered an important development in view of the construction of powerful hydroelectric stations on the Soviet Union's biggest rivers.

At a conference held in Moscow to discuss theoretical problems of fisheries, in addition to the problems connected with the acclimatization of sturgeon varieties, emphasis was laid on problems of artificial reproduction of fish. (*The Fishing News*, March 26, 1964.)



### United Arab Republic

#### FISHERY PRODUCTS IMPORTS AND EXPORTS, JANUARY-JUNE 1963:

Fishery products imports by the United Arab Republic (UAR) in the first half of 1963 (January-June) were 2,858 metric tons valued at £E382,858 (US\$880,600). Canned and preserved fishery products (including anchovies and herring) accounted for about 85 percent of the total imports and about 90 percent of the value.

UAR fishery products exports in the same period of 1963 totaled 1,229 tons valued at £E535,010 (\$1,231,000). Fresh and frozen shrimp was the principal export item for a total of 898 tons valued at £E479,873 (\$1,104,000). Of that total, 684,000 pounds (310 metric tons) was exported to the United States market at a time when shrimp prices had risen substantially from those of a year earlier. On a per-pound basis, the average export price of shrimp in the UAR during that period was 56 U. S. cents a pound as compared with an average of 41 cents in 1962.

In 1962 (January-December) the UAR exported 1,545 tons of shrimp valued at £E607,598 (\$1,397,475). United States shrimp imports from that country during 1962 amounted to 1,783,000 pounds, or 809 metric tons. (United States Embassy, Cairo, April 1, 1964.)

Note: See *Commercial Fisheries Review*, December 1963 p. 80.



### United Kingdom

#### NEWEST ADDITION TO FREEZER-TRAWLER FLEET LAUNCHED:

A new British freezer stern trawler, the *Cape Kennedy*, was launched at a Selby shipyard in England on June 12, 1964. It is the second trawler of that type to join the trawling fleet of a large British fishing company.



Fig. 1 - Launching of British freezer stern trawler *Cape Kennedy* at Selby, England, June 12, 1964.

The *Cape Kennedy* is driven by a Diesel-electric power system, has an identical hull formation, and is of the same size (226 feet 6 inches long overall) as the stern trawler *Ross Valiant* built by the same shipyard and launched in January 1964.



Fig. 2 - Freezer stern trawler *Cape Kennedy*, sistership to *Ross Valiant*, after launching.

## United Kingdom (Contd.)

The vessel is to be built to Lloyds standards (\*100 A.1.) for a single screw stern trawler. She has a bar keel and a well raked radius stem above the load waterline with cut-away forefoot for working in ice. There are two continuous decks--the upper one being the weatherdeck, and the lower the freeboard deck. Space between the decks provides accommodation for a crew of 28 and space for factory work. Space beneath the lower deck is for ballast, Diesel oil, fish livers, freshwater tanks, and chain lockers.



Fig. 3 - Stern view of Cape Kennedy showing stern ramp.

A prominent feature of the vessel is the wheelhouse topped by the navigating bridge. On the port side is the chartroom and the

completely equipped wireless room is on the starboard side. Two tall gallows span the vessel to carry and work the fishing gear; one some 20 feet behind the wheelhouse boat-deck carries the trawl warps from the winch; the other is positioned across the end of the stern ramp to lift the cod end on to the fishdeck.

A cold-storage room of 22,000 cubic feet is insulated and can be refrigerated to a temperature of -20° F., and accommodate up to 400 tons of 100-pound fish blocks. The fish blocks are produced by a battery of 10 vertical plate freezers which have a maximum potential daily (24 hours) output of nearly 35 tons.

The new vessel is expected to enter service early in 1965. The machinery specification is similar to that of Ross Valiant except for the Diesel-electric propulsion machinery which consists of three 8-cylinder 925 b.hp. 700 r.p.m. turbo-charged marine propulsion engines each coupled to generators in tandem--and the trawl winch, which is of a different type.

The owners say that fish from the Cape Kennedy will help to meet the increasing demand for fish sold under their same unchanged price contract as fish produced by the Ross Valiant, which has helped to keep fish prices steady the year-round.

Note: See Commercial Fisheries Review, April 1964 p. 76.




#### PORTION OF UNITED STATES SHRIMP FLEET MIGRATES TO CENTRAL AND SOUTH AMERICA

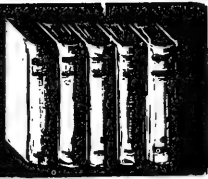
During 1963, a portion of the United States Gulf and South Atlantic shrimp fleet migrated to Central and South American countries. Several of the larger shrimp firms set up companies in Latin American countries and moved a part or all of their fleets to those countries. The development pointed to the increasing trend for fishing fleets to become international in operation.

The possibilities of shrimp fishing off Central and South America were first made known by the U.S. Fish and Wildlife Service exploratory work in 1941-43. Subsequent work in recent years by vessels of the U.S. Bureau of Commercial Fisheries Exploratory and Gear Research Station at Pascagoula, Miss., corroborated the earlier findings. Fishing by vessels engaged in the fishery is now centered between Trinidad and the mouth of the Amazon River.

"Fisheries of the United States 1963"  
C. F. S. No. 3500  
U. S. Bureau of Commercial Fisheries  
Washington, D. C.



# FEDERAL ACTIONS



## Department of Commerce

### BUREAU OF THE CENSUS

#### TIME EXTENDED FOR COMMENTS ON CHANGES IN EXPORT CLASSIFICATION:

An extension of 15 days, from July 31 to August 15, 1964, was announced by the U. S. Bureau of the Census for receiving comments and recommendations on Public Bulletin B-8, "Proposed Changes in Schedule B--Statistical Classification of Domestic and Foreign Commodities Exported from the United States."

The time was extended following a meeting of spokesmen for business and trade organizations with officials of the Bureau of the Budget and the Census Bureau, and was in recognition of the fact that the mailing of the Bulletin had been unavoidably delayed.

The Bureau of the Census in an announcement on June 12, 1964, invited comments on the proposed classification which will enable it to issue monthly and annual reports in terms of the Standard International Trade Classification (SITC), in order that United States exports may be compared with data of other trading nations. Statistics on product classes based on the U. S. Standard Industrial Classification (SIC) will be reported annually, to permit comparisons with domestic production.

Details of the proposed revision are contained in Public Bulletin B-8, which has been sent to about 35,000 manufacturing and exporting firms.

Census officials pointed out that if some or most of the recommendations were submitted in advance of the deadline of August 15, 1964, it would expedite their proper consideration and the preparation of the new reporting system, to be effective in January 1965.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### REGULATIONS PROPOSED FOR PROCEDURES ON COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT:

Proposed regulations setting up procedures to be used by the Secretary of the Interior in giving financial aid to state agencies for research and development of the commercial fisheries resources of the Nation were announced by the U. S. Department of the Interior on July 8, 1964. The Notice of Proposed Rule Making was published in the Federal Register of July 10, 1964. The proposed regulations are to be issued under 50 CFR Part 253, pursuant to the authority granted the Secretary of the Interior by section 8 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309).

The new law, passed by Congress this year and signed by President Johnson May 20, 1964, provides for payment of \$5 million annually to States for commercial fishery research and development over a five-year period. The States will be required to provide matching funds equal to at least 25 percent of project costs.

The Act also authorizes the allocation of \$400,000 annually for two years and \$650,000 for each of the following three years to States where there is a commercial fishery failure resulting from natural or undetermined causes.

A third provision of the law authorizes the allocation of \$100,000 a year to States for developing new commercial fisheries.

A fourth provision provides for loan funds to Alaska's fishermen for charter of fishing vessels for temporary replacement pending the repair or permanent replacement of ves-

sels lost or damaged in the March 27, 1964, Alaska earthquake disaster. Repayment of those loans is to be made only from the net profits of the operation of the chartered vessels after deducting a reasonable amount for the salary of the fishermen chartering the vessels. (Regulations covering this provision of the act were published in the May 23, 1964, Federal Register.)

Interested persons were given until August 9, 1964, to submit written comments, suggestions, or objections on the proposed regulations to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D. C. But written comments, suggestions, or objections to Section 253.4 of 50 CFR Part 253 dealing with "Use of resource disaster funds" had to be submitted by July 20, 1964.

The proposed regulations as published cover definitions, interpretation of the authorization, use of research and development funds, use of resource disaster funds, use of new commercial fishery funds, financial responsibility, reporting, record retention, audit and inspection, patents and inventions, etc.

The proposed regulations as published in the Federal Register of July 10, 1964, follow:

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### [ 50 CFR Part 253 ]

### COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT

#### Notice of Proposed Rule Making

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by section 8 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309), it is proposed to adopt 50 CFR part 253 as set forth below. The purpose of these regulations is to provide for procedures to be used by the Secretary in providing financial assistance to State Agencies for research and development of the Commercial fisheries resources of the Nation and, in cooperation with State Agencies, directly to the commercial fisheries in cases where he has determined that there is a commercial fishery failure due to a resource disaster arising from natural or undetermined causes.

This proposed regulation relates to matters which are exempt from the rule making requirements of the Administrative Procedures Act (5 U.S.C. 1003); however, it is the policy of the Department of the Interior that, whenever practicable, the rule making requirements be observed voluntarily. Accordingly, interested persons may submit in triplicate

written comments, suggestions, or objections with respect to the proposed amendments to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240, within 30 days of the date of publication of this notice in the FEDERAL REGISTER, except that comments with respect to section 253.4 must be submitted within 10 days.

Sec.	Definitions.
253.1	Interpretation of the authorization.
253.2	Use of research and development funds.
253.3	Use of resource disaster funds.
253.4	Use of new commercial fishery funds.
253.5	Financial responsibility.
253.6	Reporting.
253.7	Record retention.
253.8	Audit and inspection.
253.9	Officials not to benefit.
253.10	Patents and inventions.
253.11	Convict labor.
253.12	

**AUTHORITY:** The provisions of this part 253 issued under sec. 8, Public Law 88-309.

#### § 253.1 Definitions.

As used in this part, terms shall have the meanings ascribed in this section.

(a) *Secretary.* The Secretary of the Interior or his authorized representative.

(b) *Act.* Public Law 88-309.

(c) *Research and development funds.* Funds, the appropriation of which, were authorized by subsection 4(a) of the Act.

(d) *Resource disaster funds.* Funds, the appropriation of which, were authorized by subsection 4(b) of the Act.

(e) *New commercial fishery funds.* Funds, the appropriation of which, were authorized by subsection 4(c) of the Act.

(f) *Person.* Individual, association, partnership or corporation, any one or all as the context requires.

(g) *Primary producer.* A person owning or having a beneficial interest in and managing a vessel or gear engaged in harvesting raw fish.

(h) *Net profits.* The net profit, before taxes, as computed in accordance with generally accepted accounting standards with due regard to the practices in the locality in which the fishing operation is conducted.

(i) *Reasonable amount as determined by the Secretary for the salary of the fisherman.* A computed amount equal to the average income of the applicant from fishing operations during the 3 preceding calendar years, with a maximum of \$3,000, computed from applicant's income tax returns for these years.

(j) *Contractor.* A person, agency or institution performing services, under contract with the State Agency, in carrying out the provisions of a project agreement.

#### § 253.2 Interpretation of the authorization.

The terms used in the Act to describe the authorization to the Secretary are construed to be limited to the meanings ascribed in this section.

(a) Supplement, and, to the extent practicable, increase the amounts of State funds. The words "supplement, and, to the extent practicable, increase the amounts of State funds" mean that State funds, to be used for at least 25 percent of the cost of a project financed with research and development funds,

will be additional funds provided for that project and will not represent funds diverted from some other fishery project except that during fiscal years 1965 and 1966, the fact that a State Legislature did not meet after approval of this Act will be considered evidence that it is not practicable for the State Agency to furnish funds that have not been previously used for other fishery projects.

(b) Resource disaster arising from natural or undetermined causes. The words "resource disaster arising from natural or undetermined causes" mean a serious disruption of the harvesting of raw fish, caused by inability to catch the raw fish, or inability to sell the catch, because of a natural or undetermined cause. It does not include inability to sell the catch because of competition from imported or other competitive products.

(c) Developing a new commercial fishery. The words "developing a new commercial fishery" mean the development of a fishery for species of fish not common to the commercial fishery in the State in which the development is anticipated, or on stocks of fish not then being utilized commercially.

(d) Manufactured or processed fishery merchandise. The words "manufactured or processed fishery merchandise" mean fishery products which are included in the tables entitled Manufactured Fishery Products appearing in the annual Bureau of Commercial Fisheries Statistical Digests, Fishery Statistics of the United States. Data on new products, or the collection of statistics on products not formerly covered in these tabulations, will only be included in the subsequent year's determination of the apporportionments.

#### § 253.3 Use of research and development funds.

(a) *Apportionment and obligation.* On July 1 of each year, or as soon thereafter as practicable, the Secretary shall certify to the respective State agencies and the Secretary of the Treasury the amount of the respective apportionments of funds appropriated pursuant to section 4(a) of the Act. The Governor of each State shall notify the Secretary which agency of the State government is the agency authorized under its laws to regulate commercial fisheries and a duly authorized official of the State shall certify as to the duly appointed official authorized in accordance with State law to commit the State to participation under the provision of the Act, to sign project documents, and to receive payments. The Secretary shall be advised promptly of any change made in such authorizations. No funds may be obligated until aforesaid certification has been received. Proposed payments may be submitted at any time after the apportionment is made, but must be submitted at least 120 days prior to the end of the fiscal year following the year in which the apportionment to be charged was made. Notice of obligation of the funds will be furnished to the appropriate State agency as soon as possible after approval of the project by the Secretary.

(b) *Preliminary project statement.* A preliminary project statement shall be submitted for each proposed project which shall contain such fundamental

information as the Secretary may require, in order to determine if the project should be approved. The preliminary project statement shall include plans, specifications, duration, experimental design, personnel and cost estimates, as well as the source of funding.

(c) *Project agreement.* After the Secretary shall have approved a preliminary project statement, mutual obligations to be undertaken by the operating agencies shall be evidenced by a project agreement to be executed between the State Agency and the Secretary for each such project.

(d) *Prosecution of work.* (1) The State Agency shall carry all approved projects through to a stage of completion acceptable to the Secretary with reasonable promptness. Failure to complete the project to the satisfaction of the Secretary shall be cause for the Secretary to withhold further payments until the project is satisfactorily completed. Projects may be terminated upon determination by the Secretary that satisfactory progress has not been maintained. The Secretary shall have the right to inspect and review work being done at any time.

(2) All construction work will be performed by contract awarded to the lowest responsible bidder as the result of free and open competitive bidding.

(3) Research work shall be continuously coordinated by the State Agency with other studies conducted by the State and other agencies in order to avoid unnecessary duplication.

(4) All work shall be performed in accordance with applicable State laws, except when contradictory to Federal laws or regulations, in which case Federal law or regulations will prevail.

(e) *Economy and efficiency.* No project shall be approved until the State has shown to the satisfaction of the Secretary that appropriate and adequate means shall be employed to achieve economy and efficiency in the completion of the project.

(f) *Contracts.* Supply, service, equipment and construction contracts involving an expenditure of \$2,500 or more entered into by a State Agency for the execution of approved project activities shall be based upon free and open competitive bids. If a contract is awarded to other than the lowest responsible bidder, the payment to the contractor out of the cost of the project shall be based on the lowest responsible bid, unless it is satisfactorily shown that it was advantageous to the project to accept a higher bid. Upon request, the State Agency shall certify and promptly furnish to the Secretary a copy of each contract executed and copies of all bids received concerning the contract.

(g) *Form of vouchers.* Vouchers on forms provided by the Secretary and certified as therein prescribed, showing amounts expended on each project and the Federal portion claimed to be due on account thereof shall be submitted to the Secretary by the State Agency either after completion of each project or as the work progresses.

(h) *Safety and accident prevention.* In the performance of each project, the State shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation. The State shall be responsible for all safeguards, safety devices, and protec-

tive equipment are provided and will take other needed actions reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of work on the project.

(i) *Personnel.* The State Agency or the contractor shall maintain an adequate and competent force of employees to initiate and carry out the project through to satisfactory completion. Personnel employed on approved projects by the State Agency shall be selected on the basis of their competence to perform the services required and shall conduct their duties in a manner acceptable to the Secretary.

(j) *Nondiscrimination.* Each project agreement shall contain the applicable sections of Executive Order No. 10925, dated March 6, 1961, as amended, pertaining to nondiscrimination and shall also be subject to Public Law 88-352 and any regulations promulgated thereunder.

#### § 253.4 Use of resource disaster funds.

(a) *Determination.* The Secretary shall cause to be published in the FEDERAL REGISTER a notice of finding that a commercial fishery failure due to a resource disaster arising from natural or undetermined causes when such a finding is made. After such publication, resource disaster funds may be used for the following purposes with the cooperation of the respective State Agencies:

(1) Payments causing the removal from the usual markets of stocks of fish or shellfish of the species listed in the said finding which are preventing normal trade operations. No payments will be made under this paragraph unless the Secretary deems such action necessary to aid in restoring normal trade operations; the person receiving such payment, if not the primary producer, provides evidence that he has paid the primary producer, or such other person from whom the raw fish was purchased, the entire purchase price of the fish; the person receiving such payments has furnished the Secretary with such information regarding purchases, costs, sales, etc., as the Secretary may require; and satisfactory evidence of removal of the products from channels of distribution, including storage, shall be provided to the Secretary. No payments may be made for any product which was not removed from the usual channels of distribution prior to the approval of this Act.

(2) Payments to primary producers of the species of fish listed in the said finding to assist them in obtaining gear or equipment necessary to operate in the same or a different fishery than that affected by the said resource disaster. No payments will be made under this paragraph unless the Secretary deems such action necessary to aid in restoring primary producers adversely affected by the said commercial fishery failure to a condition where they can operate profitably; the person receiving such payments furnishes the Secretary with such information regarding catches, sales and costs as the Secretary may require; and the person receiving such payments agrees to operate the gear purchased with the assistance of such payment in a manner satisfactory to the Secretary.

(3) Short-term loans for operating expenses of primary producers. When

loans are made under this paragraph, the interest rate shall be 3 percent and repayment will be required only from net profits of the fishing operation, which net profit shall be reduced by such reasonable amount as determined by the Secretary for the salary of the fisherman. No such loans will be made unless the Secretary deems such action necessary to aid in restoring primary producers adversely affected by the said commercial fishery failure to a condition that will permit them to resume operations; the funds are not otherwise available on reasonable terms; and the past earning and credit record of the applicant is such that it provides reasonable assurance of repayment.

(4) Payments to State Agencies for projects directly related to the restoration of the fishery affected by the said resource disaster or to prevent a similar failure of the fishery in the future. Such preliminary project proposals and their processing will be subject to all regulations relating thereto in this Part, except that these projects will be given preference over other proposed projects with reference to the use of funds obtained under subsection 4(b) of the Act, and Federal funds may be used for 100 percent of the cost of the project if all of the funds are obtained from appropriations authorized under subsection 4(b) of the Act.

(b) *Non-determination.* At any time when there is no finding of a commercial fishery failure as described in subsection (a) of this section, the Secretary may, if he deems such action to be in furtherance of the purposes of the Act, approved preliminary project proposals for funding under subsection 4(b) of the Act from funds carried over from previous fiscal years; provided however, that no preliminary project proposal from any State will be funded under this subsection until that State has had all of its available apportioned funds, if any, obtained from appropriations authorized under subsection 4(a) of the Act, obligated.

#### § 253.5 Use of new commercial fishery funds.

Preliminary project proposals leading to the establishment of a new commercial fishery may be approved for funding under this section when the Secretary finds that the proposal, if approved and carried out, will reasonably assure the establishment of a new commercial fishery within the State submitting the proposal. All proposals under this section will be subject to all applicable regulations of this Part, except that 100 percent of the project costs may be paid from Federal funds and, if the Secretary deems that the proposal will further the

purposes of the Act, these proposals may be approved without the requirement that the State submitting the proposal first have obligated all of its apportioned funds, if any.

#### § 253.6 Financial responsibility.

(a) State Agencies are required to account for each approved project. Cost accounting records, consistent with generally accepted accounting standards, shall be maintained for each project separately.

(b) State Agencies are responsible for the financial management of the project. Appropriate internal controls will, therefore, be adopted and installed to insure that the project is accomplished in the most efficient and economical manner.

#### § 253.7 Reporting.

(a) Quarterly progress reports on approved projects will be furnished by State Agencies. These reports will be compiled on forms approved by the Secretary. Progress payments or other disbursements will not be made unless reporting requirements are met.

(b) Completion reports, on forms approved by the Secretary, are required when the project is completed pursuant to the project agreement. Final progress payments to State Agencies on individual projects will not be made until a completion report has been rendered and accepted by the Secretary. Completion reports with respect to research and development projects will contain a certification that the State Agency has contributed at least 25 percent of the total project cost.

(c) A mutual release will be executed by the State Agency and the Secretary, or his authorized representative, when both parties have fulfilled their respective obligations under the agreement or contract.

(d) Copies of audit reports on audits of projects made by State auditors or inspectors shall be furnished the Secretary and will not be returned to State Agencies.

#### § 253.8 Record retention.

(a) All records of accounts, reporting and supporting documentation thereto will be retained by the State or State Agency for a period of 3 years after the project is completed.

(b) Loan applicants, to whom a loan has been granted pursuant to section 9 of Public Law 88-309 or § 253.4(a)(3), shall retain all records incident to the fishing operation for a period of 3 years after the Note has been satisfied.

#### § 253.9 Audit and inspection.

(a) Authorized representatives of the United States Government and the United States General Accounting Office

shall have the right to audit, examine or inspect accounts, books, documents and other pertinent records involving operations and transactions under these regulations.

(b) State Agencies are expected to provide for a system of periodic internal review or audit by State employees.

(c) Periodic audits will be performed on projects with State Agencies and other operations provided for in Public Law 88-309 by authorized representatives of the United States Government. Audits may be performed on active projects and within 3 years after the project is completed.

(d) Audit exceptions involving adjustments in payment to any State Agency on any project, whether active or completed, may be applied to other approved projects or to applicable apportionments of funds to State Agencies.

#### § 253.10 Officials not to benefit.

No member of or delegate to Congress or resident commissioner, shall be admitted to any share or any part of an agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

#### § 253.11 Patents and inventions.

It is understood and agreed that inventions or discoveries of processes, devices and methods of application conceived and developed as a result of a contract and all rights therein shall be the property of the Government. In furtherance of a contract, the State Agency shall agree to assign unto the Government any and all rights, title and interest which it may have or claim to have in any patentable invention or discoveries of processes, devices and methods of application arising out of activities under this contract. The State Agency shall further agree that all its employees who shall perform work under a contract shall assign any patent rights which they may have or claim to have in discoveries or inventions resulting from work therefrom unto the Government. With respect to any subcontract, the State Agency's obligation under this section will be discharged upon its inclusion in such subcontract a patent rights article not less favorable to the Government than as provided herein.

#### § 253.12 Convict labor.

In connection with the performance of work, the State Agency agrees not to employ any person undergoing sentence of imprisonment at hard labor.

Secretary of the Interior.  
STEWART L. UDALL.

Note: See *Commercial Fisheries Review*, August 1964 p. 95.



## United States Court of Appeals

### FEDERAL MARITIME COMMISSION ORDER FOR LOWER ALASKA WATER TRANSPORTATION RATES STAYED:

The United States Court of Appeals for the Ninth Circuit, San Francisco, Calif., on June 1, 1964, stayed the May 13, 1964, order of the Federal Maritime Commission to the Alaska Steamship Company requiring it to reduce tariffs to the extent that the rates do not produce a rate of return exceeding 10 percent. Those rates affect canned salmon traffic southbound from Alaska and cannery supplies northbound to Alaska. The Court's injunction will remain in effect until a final decision is made by the Court on the merits of the Alaska Steamship Company's petition for a review. The Court could uphold the Commission's decision, could allow the tariffs to remain in effect, or could remand the matter to the Federal Maritime Commission for further review.



## Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**INTERIM ADJOURNMENT:** On August 20, 1964, the House adopted H. Con. Res. 359, to provide that when the House adjourns on August 21, it will stand adjourned until August 31. The Senate concurred in H. Con. Res. 359, to provide that when the House and Senate adjourn on August 21, they will stand adjourned until August 31.

**ALASKA OMNIBUS ACT AMENDMENT:** On July 21, 1964, the House passed H. R. 11438, to amend the Alaska Omnibus Act to provide assistance to Alaska for reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves. On the same day, the House considered S. 2881 (passed by the Senate on June 30). The House amended S. 2881 by striking out all after the enacting clause and inserted the provisions of H. R. 11438 as passed, and H. R. 11438 was laid on the table. S. 2881 as amended was sent to the Senate.

On July 24, 1964, the Presiding Officer laid before the Senate the amendment of the House of Representa-

tives to S. 2881, which was to strike out all after the enacting clause and insert: "That this Act may be cited as the '1964 Amendments to the Alaska Omnibus Act'." Senate disagreed to House amendment, asked for conference with the House, and appointed conferees.

On July 28, the House insisted on its amendment to S. 2881, disagreed to by the Senate. The House agreed to a conference and appointed conferees. On July 28, House and Senate conferees met in executive session to resolve the differences between the Senate- and House-passed versions of S. 2881. Conferees reached agreement in principle and instructed the staff to draft language embodying the principles as agreed upon.

On August 4, 1964, conferees, in executive session agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 2881, providing assistance to Alaska for reconstruction of damage from the recent earthquake.

On August 6, 1964, Congressman Aspinall submitted to the House the conference report (H. Rept. 1710) on S. 2881.

On August 7, 1964, the House by a voice vote adopted the conference report on S. 2881, and sent the legislation to the Senate. The Senate on August 8, 1964, adopted the conference report on S. 2881, and cleared the bill for the President.

On August 19, 1964, the President signed into law S. 2881 (P. L. 88-451). Authorizes a little over \$50 million for highway repair and reconstruction, the restoration of certain public facilities, urban renewal, harbor reconstruction, and housing and financial programs. This is in addition to S. 2772 (P. L. 88-311) which authorized \$23.5 million in transitional grants to Alaska; and H. J. Res. 976 (P. L. 88-296) which appropriated \$50 million to provide emergency financial assistance to areas determined by the President to have suffered major natural disasters (principally intended for Alaska's earthquake damage).

**ANADROMOUS FISH CONSERVATION:** Anadromous Fish (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session), Serial No. 88-22, 109 pp., printed. Contains hearings held May 26 and 27, 1964, on H. R. 2392, H. R. 3195, H. R. 3314, H. R. 3697, H. R. 3779, H. R. 3995, H. R. 4225, H. R. 6856, H. R. 11180, and H. R. 11398, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states. Included are contents of the bills; reports from various Federal agencies; statements of Congressmen, and Federal, state, association, and industry officials. Purpose is to carry out a positive and comprehensive program of conserving and developing the Nation's anadromous fishery resources that are subject to depletion from Federal, state, and private water-resource developments and for other causes, or, with respect to which this country has international commitments.

On August 4, 1964, the House Committee on Merchant Marine and Fisheries ordered favorably reported (H. Rept. 1768) H. R. 2392, authorizing the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the nation's anadromous fish in cooperation with the several states. The bill also authorizes the Federal Government to cooperate



with state agencies in conducting research; in constructing, installing, and maintaining fish passage devices and spawning conditions for anadromous fish; operating fish hatcheries, etc. The bill applies to species of anadromous fish—those such as salmon which spawn in fresh water but live much of their lives in the sea—on all coasts of the United States. H. R. 2392 was amended extensively. Section 4 was amended to limit the authorization for appropriations to \$25 million over a five-year period and no state could receive more than 20 percent of the total funds. Section 5 now requires a 50 percent cost-sharing ratio between the Federal and state governments. A new section 7 provides that pollution of estuarine areas will be reported immediately to proper authorities for appropriate action. The Senate Committee on Commerce as of early August 1964 had not conducted hearings on this proposal.

On August 17, 1964, the House was scheduled to take up H. R. 2392. Unfortunately, lack of time prevented its consideration at that time. The bill will again be scheduled after the recess. In the Congressional Record (p. 20046) of August 20, Congressman Keith, in an extension of his remarks, supported H. R. 2392, pointing out to his colleagues the necessity of its consideration as soon as possible. Would enable the Secretary of the Interior, in cooperation with the states, to improve the conservation and development of anadromous fish resources.

**CHEMICAL PESTICIDES COORDINATION:** On July 24, 1964, Senator Ribicoff announced that the Subcommittee on Reorganization and International Organization of the Senate Committee on Government Operations was to resume its hearings on the role of Government in pesticide use, regulation, and research. Senator Ribicoff in the Senate made some remarks on the "workings of the various Government agencies responsible for pesticide regulation and research" (Congressional Record, July 24, 1964, p. 16331).

Testimony presented during a two-day hearing in Washington, D. C., on July 28-29 led Senator Ribicoff to point to endrin as a "long-distance killer that silently makes its way" down the Mississippi to cause massive fish kills in Louisiana. His comment came as officials of the Velsicol Chemical Corporation appeared before the Subcommittee on Reorganization and International Organizations of the Senate Committee on Government Operations to contest Public Health Service claims that the chlorinated hydrocarbon pesticide is the probable fish-killer. There was also further testimony on the fish kill in the Mississippi River.

**COMMERCIAL FISHERIES RESOURCES SURVEY:** On August 4, 1964, the Senate Committee on Commerce, in executive session, ordered favorably reported with amendments S. J. Res. 174, authorizing the Bureau of Commercial Fisheries to conduct a survey of the marine and fresh-water commercial fishery resources of the United States, its territories and possessions.

On August 18, 1964, the Senate Committee on Commerce favorably reported (S. Rept. 1469) with amendments S. J. Res. 174.

On August 19, 1964, the Senate passed, amended, S. J. Res. 174. Bill was cleared for House action.

**EXPORT CONTROL OF FISHERY PRODUCTS:** Introduced in the House on July 27, 1964, H. R. 12071 (Pelly), H. R. 12073 (Stinson), and H. R. 12074 (Tollefson), to control the exportation from the United States,

its territories and possessions of fish and fishery products; referred to the Committee on Merchant Marine and Fisheries.

On August 5, 1964, Congressman Pelly spoke in the House inserting in that day's Congressional Record an editorial from the July 24 issue of the Seattle Post Intelligencer concerning the invitation of the Governor of Alaska to the Japanese fishing industry to buy salmon in Prince William Sound.

On August 15, 1964, Congressman Pelly under an extension of remarks, inserted in the Congressional Record (pp. A4340-4341) a resolution by the Maritime Trades Department, Puget Sound district, to the Maritime Trades Department, AFL-CIO, meeting in Chicago, July 30 and 31, concerning the Governor of Alaska's action in inviting the Japanese fishing industry to buy part of the Alaska salmon catch.

**FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING:** On July 23, 1964 (Magnuson--for himself and Senator Bartlett) introduced in the Senate S. 3026, a bill to provide that for a two-year period certain fishermen's organizations regardless of their technical legal status, shall have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends; referred to the Committee on Commerce. Senator Magnuson, in his remarks in the Senate stated that S. 3026 is similar to S. 1135, a bill which he introduced in the 1st session of the 88th Congress, and which had the purpose of establishing a sound economic relationship between fishermen, fish dealers, and canners, except that S. 3026 would provide for a two-year trial basis. (Congressional Record, p. 16125.)

**FISH PRICES IN ALASKA:** On July 22, 1964, Congressman Pelly spoke in the House on the dispute over the price of fish in Prince William Sound area, Alaska (Congressional Record, July 22, 1964, p. 15957).

**FISH PROTEIN CONCENTRATE:** On August 10, 1964, Senator Bartlett spoke in the Senate concerning the hearings to be held on August 14 by the Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Commerce on fish protein concentrate. In his remarks Senator Bartlett mentioned that the Bureau of Commercial Fisheries has been conducting experiments aimed at the development of a high-grade fish protein concentrate which would be inexpensively produced. (Congressional Record, p. 18255.)

The Merchant Marine and Fisheries Subcommittee of the Senate Committee on Commerce on August 14, 1964, held hearings on the potential of fish protein concentrate to the United States fisheries industry. Testimony was received from the Director of the U. S. Bureau of Commercial Fisheries and from a representative of the National Academy of Sciences Scientific Advisory Committee on Marine Protein Concentrate. The hearings were recessed subject to call.

On August 15, 1964, Senator Douglas spoke in the Senate inserting in that day's Congressional Record (p. 19116) an article from that morning's issue of the New York Times concerning fish protein concentrate.

**FISHING INDUSTRY PROBLEMS:** On July 23, 1964, Senator Pelly spoke in the Senate and inserted in that day's Congressional Record (p. 16130) an article which appeared in a journal entitled Maritimes, published by the Oceanography Department of the University of

Rhode Island. The article ("An Antiquated and Fragmented U.S. Fishing Industry Faces Many Problems") gives an appraisal of the problems of the fishing industry.

**FOOD MARKETING NATIONAL COMMISSION:** On July 31, 1964, Senator Hart inserted in the Congressional Record (p. 16928) a magazine editorial on the newly formed National Commission on Food Marketing.

**FOREIGN VESSELS' PROCESSING OF FISHERY PRODUCTS IN U.S. TERRITORIAL WATERS BANNED:** On August 6, 1964, H. R. 12275 (Pelly) was introduced in the House, referred to the Committee on Merchant Marine and Fisheries; and S. 3086 (Magnuson, for himself and Senator Jackson) was introduced in the Senate, referred to the Committee on Commerce; bills to amend the Act prohibiting fishing in the territorial waters of the United States by vessels other than vessels of the United States in order to expand the definition of the term "fisheries," to ban freezing, packing, or other processing within the territorial waters of the United States by foreign commercial fishermen or vessels. Each of the sponsors of the bills made remarks upon introducing them (Congressional Record, August 6, 1964, pp. 17747, 17761).

Introduced in the House August 11, 1964, H. R. 12316 (Tollefson), similar to H. R. 12275.

**INDIAN FISHING RIGHTS:** On August 5-6, 1964, the Subcommittee on Indian Affairs of the Senate Committee on Interior and Insular Affairs conducted hearings on problems relating to Indian fishing on the West Coast, particularly the State of Washington. Under consideration were: S. J. Res. 170, which would authorize the states to regulate off-reservation fishing by Indians; and S. J. Res. 171, which would authorize the purchase and extinguishment of Indian treaty fishing rights. The problem revolves around Indian fishing rights. Several Indian treaties, adopted more than 100 years ago, gave Indians the right to take fish at all usual and accustomed places. As a result, some Indians believe their treaty rights are not subject to regulation by the states and they use manners and methods illegal for other citizens to take fish. Conflicting court actions have resulted. The committee received testimony from officials of the Oregon Fish Commission, Columbia River Salmon & Tuna Packers Association, Astoria, Oreg., and numerous witnesses representing the following Indian tribes: Yakima, Makah, Puyallup, Quinault, Tulalip, and Warm Springs, as well as the Assistant Secretary of the Interior and the Commissioner of Fish and Wildlife.

**MEDICAL CARE FOR VESSEL OWNERS:** On July 28, 1964, the House by a vote of 202 yeas to 170 nays passed H. R. 3973, to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service. This passage was subsequently vacated and S. 978 (passed by Senate May 28, 1963), a similar bill, was passed in lieu after being amended to contain the House-approved text. H. Res. 799, the open rule under which the legislation was considered, had been adopted earlier by a voice vote.

On August 11, 1964, the Senate concurred in House amendment to S. 978, clearing the bill for the President.

On August 13, 1964, the President signed into law S. 978 (P. L. 88-424).

**NAVIGABLE WATERS OBSTRUCTION MARKING:** introduced in the Senate on July 9, 1964, S. 2991 (Magnuson), to clarify the responsibility for marking of obstructions in navigable waters. Recommended by the Secretary of the Treasury, the bill would eliminate dual responsibilities by the Department of the Army and the Coast Guard for marking of wrecks. It would vest sole responsibility for marking wrecks in the Coast Guard. Referred to the Senate Committee on Commerce. Also introduced in the House on July 21, 1964, H. R. 11964 (Bonner), identical to S. 2991; referred to the Committee on Merchant Marine and Fisheries.

**OCEANOGRAPHIC COUNCIL:** Introduced in the Senate on July 9, 1964, S. 2990 (Magnuson), to establish in the Executive Office of the President, the National Oceanographic Council. It would be composed of the Vice-President (Chairman); Secretaries of Treasury, Defense, Interior, Commerce, and Health, Education, and Welfare; director of the Office of Science and Technology; chairman of the Atomic Energy Commission; and director of the National Science Foundation. The Council would survey all oceanographic and marine science activities and develop a comprehensive program, resolving any differences. A civilian staff would be authorized. Up to \$500,000 a year would be authorized for the program. Referred to the Senate Committee on Commerce.

On August 18, 1964, Congressman Garmatz, under an extension of remarks, inserted in the Congressional Record (p. A4386) the remarks of the Chief Counsel of the House Committee on Merchant Marine and Fisheries before the Governor's conference on the National Oceanographic Program, Annapolis, Md., Aug. 13, 1964.

**OCEANOGRAPHIC RESEARCH PROGRAM:** National Oceanographic Program--1965 (Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session), Serial No. 88-23, 722 pp., printed. Contains hearings held on June 23, 24, 25, and 30, 1964, to examine the national oceanographic program for fiscal year 1965; presents statements given by various Federal government officials, and information supplied by various officials and agencies.

Speaking from the floor of the Senate on August 14, 1964, Senator Beall discussed the purpose of the First Annual Governors' Conference on the National Oceanographic Program which was held at the U. S. Naval Academy, Annapolis, Md., August 13, 1964. The program and summation of the conference were inserted in the Congressional Record, pages 18922-18923.

**OCEANOGRAPHIC RESEARCH VESSELS:** On July 28, 1964, the Senate Committee on Commerce, in executive session, ordered favorably reported, S. 2552, a bill to exempt oceanographic research vessels from the applications of certain vessel inspection laws (amended). An amendment by the Committee would broaden the definition of oceanographic research vessels to include all vessels operated for oceanographic research in the public interest as determined by the Secretary of the Treasury.

On July 31, 1964, S. 2552, was reported to the Senate, with amendment, by the Senate Committee on Commerce (S. Rept. 1276). The Senate passed the bill, with amendment, on August 1, 1964.

The House on August 3, 1964, referred to its Committee on Merchant Marine and Fisheries S. 2552.

**PACIFIC ISLAND TRUST TERRITORY DEVELOPMENT:** On July 29, 1964, the Senate Committee on Interior and Insular Affairs favorably reported (H. Rept. 605) with amendment H. R. 3198, to promote the economic and social development of the Trust Territory of the Pacific Islands. The Senate Committee entirely deleted Section 2 of the bill. This Section would have amended the Tariff Act of 1930 to permit the duty-free entry of Trust Territory goods into the U.S. Under that Section, fishery products would have been eligible for duty-free entry only if the fish were landed from U.S. or Trust Territory-flag vessels, manned by crews to two-thirds of which are nationals of the United States, . . . or citizens of the Trust Territory. Section 2 was included in the bill when it was passed by the House on August 5, 1963. The amendment by the Senate Committee means that the Trust Territory would retain its current status as a "foreign area" for the purposes of the Tariff Act. H. R. 3198 passed by the House on August 5, 1963.

On July 31, 1964, the Senate passed with amendments H. R. 3198. The Senate deleted from the bill a section which would have extended to the Trust Territory of the Pacific Islands the benefits of Section 301 of the Tariff Act of 1930, providing that articles may be admitted free of duty into the United States from areas under its flag or administration where the articles "do not contain foreign materials to the value of more than 50 percent of their total value." The bill was sent to the House.

On August 12, 1964, H. R. 3198, was cleared for the President by House concurrence in Senate amendments thereto.

**PASSAMAQUODDY TIDAL POWER PROJECT:** On August 12, 1964, the Subcommittee on Flood Control--Rivers and Harbors--of the Senate Committee on Public Works held hearings on S. 2573, authorizing the International Passamaquoddy Tidal Power Project, including hydroelectric power development of the Upper St. John River, with testimony from the Secretary of the Interior and the Secretary of the Army. The hearings were adjourned subject to call.

**STATE DEPARTMENT APPROPRIATIONS FY 1965:** On August 17, 1964, the House and Senate adopted the conference report (H. Rept. 1817) on H. R. 11134, making appropriations for the Department of State for FY 1965, clearing the legislation for the President. Included in the compromise bill is \$2,025,000 for International Fisheries Commissions, an increase of \$25,000 over the House-passed bill, but \$75,000 less than the amount recommended by the Senate. The 1965 appropriation is \$25,000 more than the amount appropriated for FY 1964, but \$114,000 less than the amount requested in the Department's FY 1965 budget estimate. H. R. 11134 passed by House May 6, 1964, and passed by Senate, amended, August 13, 1964.

**TRADE EXPANSION ACT:** Introduced in the House on July 27, 1964, H. R. 12068 (Johansen); July 28, H. R. 12081 (Betts); July 28, H. R. 12081 (Reid) and H. R. 12200 (Clausen); and August 7, 1964, H. R. 12286 (Barrett), to amend the Trade Expansion Act of 1962; all referred to the Committee on Ways and Means.

**VESSEL CONSTRUCTION SUBSIDY AMENDMENT:** On July 28, 1964, H. Res. 805, to provide for consideration of and 2 hours of debate on S. 1006 (to provide for the correction of inequities in the construction of fishing vessels) was reported favorably to the House (H. Rept. 1614). The Committee on Rules previously granted an open rule, with two hours of debate, on S. 1006.

On August 14, 1964, by a record vote of 198 yeas to 124 nays, the House passed with amendments S. 1006.

On August 15, 1964, Congressman Gill under an extension of remarks stated his support of S. 1006. (Congressional Record, p. A4340.)

On August 18, 1964, the Senate agreed to the House amendments to S. 1006, clearing the bill for the President.

**VESSEL ENGAGED IN FISHERIES:** H. R. 6007, to permit the vessel SC-1473 to engage in the fisheries, was reported favorably to the Senate by the Committee on Commerce, without amendment (S. Rept. 1266), on July 29, 1964.

S. Rept. 1266, Permitting the Vessel SC-1473 to Engage in the Fisheries (July 29, 1964, report from the Committee on Commerce, United States Senate, 88th Congress, 2nd Session, to accompany H. R. 6007), 5 pp., printed. The Committee recommended passage (without amendment) of H. R. 6007, to permit the vessel SC-1473 to engage in the fisheries and the foreign and coastwise trade of the United States. Contains the purpose of and need for the bill, and departmental reports.

The Senate on July 31, 1964, passed and cleared for the President, without amendment, H. R. 6007. It was signed by the President on August 13, 1964 (P. L. 88-282).

Introduced in the House on August 4, 1964, H. R. 12248 (Gibbons), to permit the vessel Janice Vee to be documented for use in the fisheries and coastwise trade; referred to the Committee on Merchant Marine and Fisheries.

**WATER POLLUTION CONTROL AMENDMENT:** On August 5-6, 1964, the Committee on Public Works met in executive session to consider S. 649, to amend the Federal Water Pollution Control Act. The Committee continued executive consideration of the measure on August 6. The Committee adjourned on August 6, subject to call of the chair.

**WATER RESOURCES COUNCIL:** Introduced in the Senate July 28, 1964, S. 3039 (Jackson), to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources through the establishment of a Water Resources Council and river basin commissions, and provide financial assistance to the states in order to increase state participation in such planning; referred to the Committee on Interior and Insular Affairs.

On August 20, 1964, the Subcommittee on Irrigation and Reclamation of the House Committee on Interior and Insular Affairs met in executive session and ordered favorably reported to the full committee S. 1111.





# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOL-  
LOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MWL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3505	- Fish Sticks and Fish Portions, January-March 1964, 2 pp.
CFS-3507	- Frozen Fishery Products, April 1964, 8 pp.
CFS-3517	- Fish Meal and Oil, 1963 Annual Summary, 4 pp.
CFS-3521	- Fish Meal and Oil, April 1964, 2 pp.
CFS-3525	- Wisconsin Landings, March 1964, 2 pp.
CFS-3526	- California Landings, March 1964, 4 pp.
CFS-3527	- New Jersey Landings, March 1964, 3 pp.
CFS-3528	- Virginia Landings, March 1964, 3 pp.
CFS-3529	- New Jersey Landings, April 1964, 3 pp.
CFS-3530	- Michigan Landings, March 1964, 3 pp.
CFS-3531	- New York Landings, April 1964, 4 pp.
CFS-3532	- Manufactured Fishery Products, 1962 Annual Summary, 8 pp.
CFS-3533	- California Landings, April 1964, 4 pp.
CFS-3535	- North Carolina Landings, May 1964, 4 pp.

### Wholesale Dealers in Fishery Products, 1963 (Revised):

SL-1	- Maine, 8 pp.
SL-2	- New Hampshire, 1 p.
SL-3	- Massachusetts, 11 pp.
SL-5	- Connecticut, 1 p.
SL-9	- Delaware, 1 p.
SL-10	- Maryland, 9 pp.
SL-11	- Washington, D. C., 1 p.
SL-12	- Virginia, 11 pp.
SL-14	- South Carolina, 3 pp.
SL-15	- Georgia, 2 pp.
SL-41	- Arkansas (Mississippi River and Tributaries), 2 pp.
SL-42	- Kentucky (Mississippi River and Tributaries), 1 p.
SL-43	- Alabama (Mississippi River and Tributaries), 1 p.
SL-44	- Nebraska (Mississippi River and Tributaries), 1 p.
SL-45	- Mississippi (Mississippi River and Tributaries), 1 p.
SL-48	- Indiana (Mississippi River and Tributaries), 1 p.
SL-49	- South Dakota (Mississippi River and Tributaries), 1 p.

Sep. No. 707 - The Guinean Trawling Survey.  
Sep. No. 708 - Changes in Abundance of the Marine Worm, *Glycera dibranchiata*, Associated with Seawater Temperature Fluctuations.

FL-558 - Index of Publications by the Branch of Technology, Bureau of Commercial Fisheries, 1955-59 inclusive, by F. Bruce Sanford and Helen E. Plastino, 33 pp., April 1964. Includes publications of Branch of Technology and its personnel, both Government and privately published.

SSR-Fish, No. 454 - Fur Seal Investigations, Pribilof Islands, Alaska, 1962, by Alton Y. Roppel and others, 107 pp., illus., December 1963.

SSR-Fish, No. 466 - Ecology of the Gulf of Mexico Commercial Sponges and its Relation to the Fishery, by John F. Storr, 79 pp., illus., March 1964. Discusses commercial sponges, reproduction, growth, cultivation, distribution, ecological relationships, and disease. Information on the present status of the sponge industry, commercial sponge production, and the structure of the ocean bottom in sponging areas is also included.

America Goes Fishing, Conservation Note 14, 7 pp., illus., April 1964.

Annual Report of the Commissioner, Fish and Wildlife Service, to the Secretary of the Interior, 1963, 72 pp., illus., printed, 1964. (Reprinted from the 1963 Annual Report of the Secretary of the Interior for the Fiscal Year ended June 30, 1963, pp. 281-348.) Summarizes the various activities of the Service. Describes the Bureau of Commercial Fisheries research and development programs, participation in international oceanographic studies, developments in foreign fisheries and trade, services to industry, Columbia River development program, educational activities, fur-seal operations, commissioning of the Albatross IV, and construction of an oceanographic laboratory at La Jolla, Calif. Also covers activities of the Bureau of Sport Fisheries and Wildlife, including the management of wildlife and sport fishery resources, wildlife and fishery research, and pesticides studies.

Commercial Fisheries of the Pacific Coast, Conservation Note 15, 8 pp., illus., April 1964. Describes the fisheries for salmon, pelagic fish, groundfish, and shellfish. Discusses "market fish" sold fresh on the Pacific Coast.

Extent of Acid Mine Pollution in the United States Affecting Fish and Wildlife, by Edward C. Kinney, Circular 191, 32 pp., illus., June 1964.

Fishery Research Biological Laboratory, Galveston, Fiscal Year 1963, Circular 183, 11 pp., illus., processed, 1964. Research at the Bureau of Commercial Fisheries Biological Laboratory in Galveston concerns shrimp, estuaries, and industrial bottom-fish. It is conducted under four broad programs: (1) shrimp fishery (which includes four research contracts); (2) estuarine; (3) physiology and behavior; and (4) industrial fishery. Each of those programs is subdivided into projects. This report deals with progress in project research during fiscal year 1963. Since this is a progress report, the findings recorded are preliminary in nature.

Progress in Sport Fishery Research, 1963, Circular 178, 188 pp., illus., March 1964. Discusses the work during 1963 of the U. S. Bureau of Sport Fisheries and Wildlife disease laboratories, fish nutrition laboratories, California-Nevada sport fishery investigations, Arkansas Fish Farming Experimental Station, fish-pesticide laboratory, and marine laboratories; also reservoir investigations.

Some Chronic Effects of DDT on Cutthroat Trout, by Don Allison and others, Research Report 64, 30 pp., 1964.

THE FOLLOWING REPRINTS FROM FISHERY INDUSTRIAL RESEARCH, VOL. 2, NO. 2, 1963, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

Economic Factors Related to Lake Trout Quotas on Lake Superior, by Keith D. Brouillard, pp. 1-4, illus., 1964. In some fisheries, a quota on catch as a method of management has proved successful insofar as physical yield is concerned. This method, however, has been based primarily on biological concepts, with little concern for the economic aspects. The philosophy of management should include a consideration of economic rent. This rent can be obtained by limiting costs--that is, effort--as well as by limiting production. The combination of a quota on catch and a limitation on amount of gear will produce both biological and economic benefits. The lake trout fishery on Lake Superior presents an opportunity to apply economic as well as biological principles to the management of an entire body of water. If both of these factors are considered in the regulation of the fishery, the industry will be stronger in its long-term operations.

Effect of Storage in Refrigerated Sea Water on Amino Acids and Other Components of Whiting (MERLUCCius BILINEARIS), by Edward H. Cohen and John A. Peters, pp. 5-11, illus., 1964.

List of Publications--Division of Industrial Research, by Branch, Year, and Author, 1955-61 Inclusive, by Virginia Whorley, pp. 43-84, 1964.

Storage of Fish in Refrigerated Sea Water, 2--Quality Changes in Whiting as Determined by Organoleptic and Chemical Analyses, by Edward H. Cohen and John A. Peters, pp. 21-27, illus., 1964.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DRIVE, ARLINGTON, VA. 22209.

Number Title  
MNL-5 - Denmark's Fisheries, 1963, and 1964 Trends, 20 pp.

MNL-23 - Fisheries of Chile - Part II and Part III (Supplement)--Central and South Chile, 1961-1963, 21 pp.

MNL-44 - Iceland's Fishing Industry, 1963, 31 pp.

MNL-88 - Japan's Imports and Exports of Fisheries Products, 1961/1962, 62 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FOR REFERENCE ONLY FROM THE LIBRARY, U. S. DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20240.

Studies of the Redfish (SEBASTES MARINUS L.) from the Ecological and Fishery Research Standpoints. I--The Economic Importance of the Redfish; II--Determination of Age in the Redfish, by Adolf Kotthaus, 11 pp., processed. (Translated from the German, Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, vol. 12, no. 4, 1952.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE REGIONAL OFFICE, U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Comparison between Japanese and United States Can Prices, Translation Series No. 10, 4 pp., processed, June 1964. (Translated from the Japanese, Nihon Suisan Shimbun, May 29, 1964.)

First Three-Year Plan to Investigate the Atlantic Ocean Fishing Grounds by Research Vessels Operated by Prefectural Governments, 5 pp., illus., processed, May 1964. (Translated from Official Japanese Government document.) Objectives of the First Three-Year Plan are to collect (1) scientific data and materials on the tuna and spearfish of the Atlantic, (2) samples for systematic study, and (3) oceanographic data; study the distribution of the Atlantic Ocean tuna and spearfish based on data obtained on (a) oceanographic structure and on (b) spawning and early life history, growth, age, and food habits; and ultimately contribute to the analysis on resource fluctuations. This report outlines each year's plan of investigation.

Studies on the Race of GRYPHAEA GIGAS (Thunberg). I--Local Variation in the Size of Prodissoconch, by Yataro Tanaka, Translation Series No. 8, 4 pp., illus., processed, May 1964. (Translated from the Japanese, The Venus, Japan Journal of Malacology, vol. 18, no. 2, November 1954.) A study of the size of an oyster found in Japan.

Symposium on Tuna Resource and Oceanography, Translation Series No. 9, 33 pp., processed, June 1964. (Translated from the Japanese, Maguro Gyogyo, no. 15, October 1963.) Covers Japanese views with regard to declining tuna hook catch rates, international regulation of the tuna fishery, management and research problems faced by the Japanese tuna fishermen and researchers, the Japanese Government's role, and the relationship of oceanography to tuna research.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part II - Fishing Information, May and June 1964, 12 and 8 pp. each, illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research in-

formation of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated.

**(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, May 1964, 18 pp.** (Market News Service, U.S. Fish and Wildlife Service, U.S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

**Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, May 1964, 8 pp.** (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

**New England Fisheries--Monthly Summary, May 1964, 25 pp.** (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

**New York City's Wholesale Fishery Trade--Monthly Summary--April 1964, 18 pp.** (Market News Service, U.S. Fish and Wildlife Service, 155 John St., New York, N.Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

**(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, June 1964, 8 pp.** (Market News Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of other-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

"An aid in the preparation of blood samples from fish," by S. F. Snieszko, article, *Progressive Fish-Culturist*, vol. 25, no. 4, 1963, p. 174, printed.

"Evolution of recovery nets used in tests on fish passage through hydraulic turbines," by Frederick K. Cramer, article, *Progressive Fish-Culturist*, vol. 26, no. 1, 1964, pp. 36-41, printed.

"A survey of licensed commercial trout hatcheries in Ontario," by Hugh R. McCrimmon and A. H. Berst, article, *Progressive Fish-Culturist*, vol. 25, no. 4, 1963, pp. 187-192, printed.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### AIRCRAFT SPOTTING:

"La détection des bancs de poissons par hélicoptère" (The detection of fish schools by helicopter), article, *France Pêche*, no. 83, April 1964, pp. 49-51, 53-54, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents). *France Pêche*, Boite Postale 179, Lorient, France.

### ALABAMA:

"Seafood industry brings wealth to Alabama," by George Allen, article, *Alabama Conservation*, vol. 34, no. 2, February-March 1964, pp. 25-27, illus., printed. Alabama Department of Conservation, 64 No. Union St., Montgomery, Ala. 36104. Discusses work of the State of Alabama in development of the oyster and shrimp industries.

### ALASKA:

*Alaska Commercial Fishery Operators, 1963, Statistical Leaflet No. 6, 22 pp.*, processed, April 1964. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

*Further Studies of the Afognak Lake System*, by Eugene W. Roelofs, Informational Leaflet No. 41, 20 pp., illus., processed, May 27, 1964. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

### ALEWIFES:

"A critique of the scale method for determining the age of the alewife, *Alosa pseudoharengus* (Wilson)," by Brian J. Rothschild, article, *Transactions of the American Fisheries Society*, vol. 92, no. 4, 1963, pp. 409-413, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

### ALGAE:

"Extractive compounds of marine algae (review)," by Kiichi Murata, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, February 1963, pp. 189-197, printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minatoku, Tokyo, Japan.

### ALLIGATORS:

*The Sun Worshiper*, by Percy Viosca, Jr., *Wildlife Education Bulletin* No. 25, 7 pp., illus., printed 1962.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

(Reprinted from Louisiana Conservationist, April 1960.) Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Discusses the differences between crocodiles and alligators, life history of the alligator, and commercial uses for its hide.

#### ANGOLA:

Relatorio e Contas do Banco de Angola, Exercício de 1963 (Report and Accounts of the Bank of Angola, 1963 edition), 254 pp., printed in Portuguese. Imprensa na Grafica Monumental, Limitada, Rua Neves Ferreira, 13, 1<sup>o</sup>, Lisbon, Portugal. Includes chapters on fishery landings and products produced, export data, and details on exports of fish meal and other fishery products.

#### ANTIDUMPING ACT:

"Treasury proposes changes in investigation procedures under Antidumping Act of 1921," by Harry Bodansky, article, International Commerce, vol. 70, no. 20, May 18, 1964, pp. 12-13, printed, single copy 35 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.) Proposed changes in Treasury Department regulations for conducting investigations under the Antidumping Act of 1921, as amended, were published in the Federal Register of April 23, 1964. Until June 22, interested parties were invited to comment in writing to the Commissioner of Customs.

#### AQUATIC WEEDS:

"Chemical control of aquatic vegetation in relation to the conservation of fish and wildlife," by G. E. Burdick, article, Weed Abstracts, vol. 12, no. 2, 1963, 514, printed. British Weed Control Council, 58 Mark Lane, London, England.

"Control of aquatic weeds," by C. M. Switzer, article, Weed Abstracts, vol. 12, no. 1, 1963, 167, printed. British Weed Control Council, 58 Mark Lane, London, England.

"Control of Eurasian milfoil, Myriophyllum spicatum, in Lake Hopatcong, New Jersey," by A. W. Horrocks and R. F. Smith, article, Weed Abstracts, vol. 12, no. 2, 1963, 516, printed. British Weed Control Council, 58 Mark Lane, London, England.

"Eurasian watermilfoil (Myriophyllum spicatum) in the Tennessee Valley," by G. Smith, article, Weed Abstracts, vol. 12, no. 1, 1963, 171, printed. British Weed Control Council, 58 Mark Lane, London, England.

"Feasibility of controlling aquatic weeds with snails," by D. E. Seaman and W. A. Porterfield, article, Weed Abstracts, vol. 12, no. 1, 1963, 176, printed. British Weed Control Council, 58 Mark Lane, London, England.

"Progress report on the field testing of various herbicides for aquatic weed control," by J. M. Cortell, article, Weed Abstracts, vol. 12, no. 2, 1963, 510, printed. British Weed Control Council, 58 Mark Lane, London, England.

Report on the Results Obtained by a New Method of Fertilization Tried out in the Marine Bay "Mijetskog Jezera", by Miljenko Buljan, Translation Series No. 326, 30 pp., printed, 1960. (Translated from the Serbo-Croatian, Acta Adriatica, vol. 6, no. 6, 1957, 46 pp.) Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

"Results of experimental weed control experiments in Georgia farm ponds using simplified gravity flow techniques," by W. W. Thomaston, article, Weed Abstracts, vol. 12, no. 1, 1963, 175, printed. British Weed Control Council, 58 Mark Lane, London, England.

"The status and prospects in aquatic weed control," by F. L. Timmons, article, Weed Abstracts, vol. 12, no. 3, 1963, 757, printed. British Weed Control Council, 58 Mark Lane, London, England.

#### ARGENTINA:

Produccion Pesquera de la Republica Argentina, 1963 (Fishery Production in the Republic of Argentina, 1963), 114 pp., illus., processed in Spanish. Direccion General de Pesca y Conservacion de la Fauna, Departamento de Investigaciones Pesqueras, Secretaria de Estado de Agricultura y Ganaderia, Buenos Aires, Argentina.

#### BALTIC SEA:

"Izmeneniya zapasov promyslovyykh ryb Baltiskogo morya pod vliyaniem okeanologicheskikh faktorov (po dannym Sovetskikh issledovatelei)" (Changes in the Baltic Sea populations of commercially valuable fish under the influence of oceanological factors--based on data of Soviet scientists), by T. F. Dement'eva, article, Okeanologiya, vol. 3, no. 5, 1963, pp. 875-876, illus., printed in Russian. Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.

#### BIBLIOGRAPHIES:

A Partial Bibliography on the Economic Evaluation of Sport Fishing and Fisheries Resources, by William A. Dill, FAO Fisheries Circular No. 8, 8 pp., printed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

World List of Periodicals for Aquatic Sciences and Fisheries, FB/TI9.1-Suppl. 1, 59 pp., processed in Spanish, French, and English, 1963. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This is one of a series of bibliographic Technical Papers listing titles of publications on aquatic sciences and fisheries subjects.

#### BOTULISM:

"Botulism outbreak from smoked whitefish," article, Food Technology, vol. 18, January 1964, pp. 71-72, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

"Radio-resistance of five strains of Clostridium botulinum in selected food products," by E. Wheaton, G. B. Pratt, and J. M. Jackson, article, Journal of Food Science, vol. 26, 1961, pp. 345-350, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### BRACKFISH-WATER FISHERIES:

Marshes and Men, by W. McFadden Duffy, Wildlife Education Bulletin No. 41, 15 pp., illus., printed 1962, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130.

#### BRAZIL:

Considerações sobre Amostragem de Peixes Marinhos (II) (Considerations on the Sampling of Marine Fish--II), by H. Nomura, 26 pp., illus., printed in Portuguese with English summary, 1962. (Reprinted from Boletim do Instituto Oceanográfico, vol. 12, no. 1, pp. 7-32.) Instituto Oceanográfico, Universidade de São Paulo, São Paulo, Brazil. Sampling of "pescada-foguete," *Macrodon ancylodon* (weakfish) landed at Santos, São Paulo, to determine length distribution.

Considerações sobre Amostragem de Peixes Marinhos (III) (Considerations on the Sampling of Marine Fish--III), by H. Nomura, 7 pp., printed in Portuguese with English summary. (Reprinted from Revista Brasileira de Biologia, vol. 23, no. 1, June 1963, pp. 95-101.) Instituto Oceanográfico, Universidade de São Paulo, São Paulo, Brazil. Sampling of "corvina" or croaker (*Micropogon furnieri*) landed at Santos, São Paulo, to determine length distribution.

Length-Weight Tables of Some Fish Species from Southern Brazil, by H. Nomura, Oceanografia Biológica 1962 No. 2, 6 pp., printed in English with Portuguese summary, Instituto Oceanográfico, Universidade de São Paulo, São Paulo, Brazil.

#### BRINE SHRIMP:

Brine Shrimp Fishery, Little Manitou Lake, Saskatchewan, by Georges H. Imbeault, 30 pp., illus., printed, 1963. Canadian Department of Fisheries, Ottawa, Canada.

#### CALIFORNIA:

Statistical Report of Fresh, Canned, Cured and Manufactured Fishery Products for 1963, Circular No. 38, 15 pp., printed, 1964. Biostatistical Section, Marine Resources Operations, Department of Fish and Game, Sacramento, Calif. The published record of California's 1963 fresh and canned fishery products. Tables cover landings, imports of tuna, canned fish pack, receipts of sardines for canning, and other similar topics.

#### CANADA:

Fisheries Statistics, Alberta and Northwest Territories, 1962, Catalogue No. 24-212, 10 pp., processed in French and English, May 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish landed in Alberta, 1955-62; and the quantity and value of fishery landings by lakes, 1961-62. Also presents tables showing value of fish landings in the Northwest Territories, 1955-61; quantity and value of fishery products by species, 1961-62; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Newfoundland, 1962, Catalogue No. 24-202, 26 pp., illus., processed in French and English, April 1964, 50 Canadian cents. Queen's

Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish and shellfish landed in Newfoundland, 1958-62; quantity and value of landings by species and fisheries areas, 1961/62; capital equipment used in the primary fishery operations; the number of persons engaged in the fisheries; and classification of fishing craft over, and under, 10 tons.

Fisheries Statistics, Prince Edward Island, 1962, Catalogue No. 24-203, 24 pp., illus., printed in French and English, May 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Consists of tables giving the quantity and value of fish landed on Prince Edward Island in 1961 and 1962; classification of fishing vessels by tonnage, type of gear used, length, and fisheries districts of Prince Edward Island, 1961/62; new capital investment in the commercial fishery of the island during those years; number of fishermen; and persons engaged in the major fisheries.

Quebec and Atlantic Coast Fisheries; Main Problems and Prospects, by John Proskie, 9 pp., printed, 1964. Canadian Department of Fisheries, Ottawa, Canada. A paper presented at a symposium of fisheries at Laval University, Quebec, January 14, 1964.

Report of the Fisheries Development Committee, 178 pp., printed, 1964. Fisheries Development Committee, Charlottetown, Prince Edward Island, Canada.

Whales and Dolphins of the West Coast of Canada, by G.C. Pike and L. Giovando, Circular No. 68, illus., printed, March 14, 1963. Biological Station, Fisheries Research Board of Canada, Nanaimo, B.C., Canada.

#### CARIBBEAN:

Gulf and Caribbean Fisheries Institute, Proceedings of the 16th Annual Session, Miami, Florida, November, 1963, edited by James B. Hignman, 163 pp., illus., printed, May 1964. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149. Contains papers presented at the 1963 Annual Session of the Gulf and Caribbean Fisheries Institute. The papers are grouped according to subject: the challenge to U.S. fisheries; shrimp research results; seafood and public health; current fisheries research; and Caribbean fisheries. "Why we need a 12-mile limit" is discussed in the paper presented at the first day's meeting.

#### CARP:

"Hybridization experiments in cyprinid fishes. 3--Reciprocal crosses between *Pseudorasbora parva* pumila and *Gnathopogon elongatus elongatus*," by R. Suzuki, article, *Nihon Suisan Gakkaishi*, vol. 29, no. 5, May 1963, pp. 421-423. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

"Vliyaniye razrezhennykh posadok na pitaniye i rost mododi karpa" (Effect of low stocking densities on the food and growth of carp), by V. L. Grimal'skii and S. N. Tyutyunik, article, *Trudy Kishinevsk*, vol. 25, 1961, pp. 121-132, printed in Russian, Akademii Nauk S.S.S.R., Moscow, U.S.S.R.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### CHEMICAL COMPOSITION:

"Variations in chemical composition in some commercial fishes from the south of Brazil," by K. Watanabe, article, Nihon Suisan Gakkai-shi, vol. 29, no. 5, May 1963, pp. 469-474, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### CISCO:

"Status of the deepwater cisco population of Lake Michigan," by Stanford H. Smith, article, Transactions of the American Fisheries Society, vol. 93, no. 2, 1964, pp. 155-163, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D.C. 20005.

#### CLAMS:

Survey of Eel River Cove, N.B., Softshell Clam (MYA ARENARIA) Population, by J.S. MacPhail, 11 pp., illus., printed, 1964, Biological Station, Fisheries Research Board of Canada, St. Andrews, N.B., Canada.

#### COD:

"O parazitofauna molodi treski v Barentsevom more" (Parasites of young cod in the Barents Sea), by Yu. I. Polyanskiy and I. V. Kulemina, article, Vestnik Leningradsk. Univ. Ser. Biol., vol. 18, no. 15:3, 1963, pp. 12-21, illus., printed in Russian with English summary, Vestnik Leningradsk. Univ. Ser. Biol., Leningrad University, Leningrad, U.S.S.R.

#### COLD STORAGE:

Khranenie Zamorozhenoi Ryby (Storage of Frozen Fish), edited by D.G. Riutov, 56 pp., illus., printed in Russian, 1963, 24 Kopecks (about 27 U.S. cents), Gosudarstvennoe Izdatel'stvo Torgovoi Literatury, Moscow, U.S.S.R. Discusses characteristics of changes in stored fish; and indexes of quality analyses and methods for obtaining them. Also covers in detail the storage of sturgeon, herring (Clupeidae), cod, and other species such as ocean perch and horse mackerel.

--Milan A. Kravanzja

#### CONSUMER PREFERENCES:

"Consumer survey of fish preferences," article, Trade News, vol. 16, no. 10, April 1964, pp. 6-8, illus., processed, Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Discusses a survey of preferences for fish made by a Canadian magazine. Fish buying and serving habits were elicited by a questionnaire. Results of the study showed that the most popular method of cooking was pan frying and generally "butter coated and breaded" was the favorite preparation. The preferred package size was 1-1½ pounds.

#### CRABS:

"Histamine content of tissues from the crab Carcinus maenas," by G.A. Kerkut and M.A. Price, article, Chemical Abstracts, vol. 56, April 2, 1962, 7807h, printed, The American Chemical Society, 1155 16th St., NW., Washington 6, D.C.

"Limb loss and recovery in the young king crab, Paralithodes camtschatica," by H. Kurata, article, Suisan-cho Hokkaido-ku Suisan Kenkyu Kenkyu Hokoku, vol. 26, March 1963, pp. 75-80, printed in

Japanese with English abstract. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

#### CUTTLEFISH:

"Studies on the viscera enzymes of cuttle-fish, Omastrephes sloani pacificus," by T. Takahashi, article, Mie-kenritsu Daigaku Suisan-gakubu Kiyo, vol. 5, no. 3, March 1963, pp. 384-411, printed in Japanese with English abstract. Faculty of Fisheries, Prefectural University of Mie, Tsu, Japan.

#### DENMARK:

"Danmarks fiskeeksport i 1963" (Denmark's fishery exports in 1963), article, Fiskeribladet, vol. 55, no. 12, March 1964, pp. 183-186, printed in Danish, single copy (foreign mailing) Kr. 8.00 (about US\$1.15), Fiskeribladet, W. Bamberg, København Fisketorv, Copenhagen 9, Denmark.

#### DIRECTORIES:

Directorio de Servicios e Instituciones de Pesca en America Latina. Volumen I--Argentina-Brasil-Chile-Uruguay (Directory of Fisheries Institutions and Services in Latin America. Volume I--Argentina, Brazil, Chile, Uruguay), December 1963, 220 pp., processed, limited distribution Regional Office for Latin America, Food and Agriculture Organization of the United Nations, Cano y Aponte 995, Casilla 10095, Santiago, Chile. Apart from this Volume I, the Directory will include other volumes listing the other Latin American countries not in this first volume. Processed in looseleaf form, information will be kept up to date by supplying corrected pages annually for insertion.

#### DOLPHIN:

"Studies on fishing conditions of the dolphin, Coryphaena hippurus L., in the western region of the Sea of Japan. (7) Relationship between the stomach contents and the pelagic fauna of juveniles," by S. Kojima, article, Nihon Suisan Gakkai-shi, vol. 29, no. 5, May 1963, pp. 407-414, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### EELS:

"Lake Ontario eel catches declining rapidly," article, Canadian Fisherman, vol. 51, March 1964, p. 27, printed, National Business Publications Ltd., Gardenvale, Que., Canada.

#### EUROPEAN FREE TRADE ASSOCIATION:

EFTA Markets, 49 pp., printed, March 1964, 7s. 6d. (about US\$1.05). Chamber of Commerce Publications, 68 Queen St., London EC4, England. The EFTA area (Austria, Denmark, Sweden, Portugal, Norway, Switzerland, the United Kingdom, and associate member-country Finland) is an immense market of nearly 100 million people. It is also a market with high standards of living and great purchasing power. This booklet discusses the economies of each country; the EFTA and the European Economic Community (Common Market); and transport in those countries.

#### EXPORTS:

United States Exports of Domestic and Foreign Merchandise, Commodity by Country of Destination, 1963 Annual, FT 410, 571 pp., processed, May 1964, sin-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

gle copy \$2.00. Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents data of United States exports during 1963 by SITC (Standard International Trade Classification) section and by SITC group. Commodity detail shown is that of Schedule B arranged within 3-digit groups of the SITC. Includes data on fresh, processed, and preserved fish.

#### FARM PONDS:

"Farm pond management," by Sammy Stokes, article, *Louisiana Conservationist*, vol. 14, nos. 7 and 8, July-August, 1964, pp. 16-18, illus., printed, Louisiana Wild Life and Fisheries Commission, 400 Royal St., New Orleans, La. 70130. Covers the beginning steps in building a pond for fish cultivation. Includes suggestions for selecting a good site, construction of a dam, stocking the area with the best suited species, improvement through use of fertilizer, and weed extermination.

Managing Louisiana Fish Ponds, by Max W. Summers, 85 pp., illus., printed, 1963, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Discusses choosing the proper location, constructing the pond, reconditioning old ponds, and management for fish production. Also covers manipulating fish populations, additional management problems and solutions, and fish for stocking.

"Survival of fish in deep water of farm ponds during the summer," by Otto W. Tiemeier, article, *Transactions of the Kansas Academy of Science*, vol. 65, no. 4, 1962, pp. 463-466, printed, Library of Kansas State University College of Agriculture and Applied Science, Lawrence, Kans.

#### FAROE ISLANDS:

Faroes in Figures, no. 26, June 1964, 6 pp., illus., printed, *Føroya Fiskasøla*, Torshavn, Faroe Islands. This issue contains an article, "The fishery of the Faroes in 1963," which discusses the decline in the total catch; catches off the Faroe Islands, Iceland, Greenland, and Newfoundland; landings of demersal species and herring; and disposition of the catch by salting, filleting, or drying. Also includes statistical tables on export and production of salt fish and export of dried cod.

#### FILMS:

Films on Oceanography (Catalog Series), Publication C-4, 29 pp., processed, December 1963, 25 cents. National Oceanographic Data Center, Washington, D. C. 20390. Contains brief reviews of 26 films and film strips dealing with some aspects of marine sciences. Each review includes running time, type of audience, and organization from which film is obtainable.

List of Films and Filmstrips on Fisheries and Related Subjects, 187 pp., processed, 1963, Fourth Edition. Technology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This list contains titles of films and filmstrips, together with producers, distributors, and prices (where

given). It includes films in various languages and at least one produced as far back as 1936. A short description of the subject matter is included.

#### FISH ANOMALIES:

"A bibliography of anomalies of fishes," by C. E. Dawson, article, *Gulf Research Reports*, vol. 1, no. 6, April 1964, pp. 308-399, printed, Gulf Coast Research Laboratory, Ocean Springs, Miss. Deals with the literature on fish teratology (science of biological abnormalities) in respect to both particular anomalies and their previous recognition in a species.

#### FISH BEHAVIOR:

"Metodika eksperimental'nogo izucheniya a povedeniya ryb" (Methods of experimental studies of fish behavior), by L. G. Voronin and Yu. A. Kholodov, article, *Referativnyi Zhurnal-Biologiya*, 1962, no. 1160, printed in Russian, Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

"The reaction of fish to moving backgrounds," by F. R. Harden Jones, article, *The Journal of Experimental Biology*, vol. 40, no. 3, 1963, pp. 437-446, printed, Cambridge University Press, 200 Euston Rd., London NW1, England.

"Sposobnost' nekotorykh ryb chernogo morya orientirovat'sya na istochnik zvuka" (The ability of some black sea fishes to orientate towards the source of a sound), by Yu. D. Podlipal'n, article, *Voprosy Ikhtologii*, vol. 2, no. 4, 1962, pp. 721-724, printed in Russian, Akademiia Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, U.S.S.R.

#### FISH COOKERY:

Delicacies from Louisiana Waters, 11 pp., illus., printed, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Describes, with zest, Louisiana's salt-water fish, oysters, shrimp, crawfish, crabs, and fresh-water fish. Red snapper and catfish are among the favorite finfish in that State.

#### FISH CULTURE:

"Ekologiya vyrazhchivaniya ryby na zalivnykh risovykh polyakh" (Ecology of fish cultivation rearing in flooded rice fields), by V. A. Movchan, article, *Biological Abstracts*, vol. 43, no. 3, 1963, 8712, printed, Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

"Studies on the fish-culture food, 12--On the effect of dry liver powder upon the growth of carp yearlings. 13--On the effect of fish meal, made of marine products from northern Pacific Ocean, upon the growth of carp," by T. Terao, article, *Suisan Fukajo Kenkyu Hokoku*, vol. 17, December 1962, pp. 69-81, printed in Japanese. Hokkaido Fish Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

#### FISH DISEASES:

Disease in Marine Populations, by Carl J. Sindermann, 21 pp., illus., printed, (Reprinted from *Transactions of the Twenty-Eighth North American Wildlife and Natural Resources Conference*, March 4, 5 and 6, 1963, pp. 336-356). Wildlife Management Institute, Wire Bldg., Washington, D. C. 20005.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

### FISH FINDING:

"Interrelationship between natural resources, marine research, and fishing operations. II," by Birger Rasmussen, article, *Norwegian Fishing and Maritime News*, vol. 10, no. 4, 1963, pp. 21, 23, printed, Norwegian Fishing and Maritime News, P.O. Box 740, Slottsgt 3, Bergen, Norway.

### FISH FOOD:

"Sposoby obespecheniya zhivymy kormami molodi ryb na rybovodnykh zavodakh" (Methods of providing live food for young fish in fish hatcheries), by M. M. Briskina, article, *Rybnoe Khoziaistvo*, vol. 36, 1960, pp. 133-142, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

### FISH HANDLING:

An Air-Lift Pump for Elevating Salmon, Herring and Other Fish of Similar Size, by S. W. Roach, F. G. Claggett, and J. S. M. Harrison, Circular No. 29, 6 pp., illus., printed, 1963. Technological Research Laboratory, Fisheries Research Board of Canada, Vancouver 1, B. C., Canada.

"A practical method for cleaning and dressing fish," by A. W. Lantz, article, *Trade News*, vol. 16, no. 11, May 1964, pp. 6-8, illus., processed, Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. Lists in brief precise terms, the 11 steps in preparation of fish for cooking. For each step there is an explanatory photograph or diagram.

### FISH KILLS:

Report on Investigations of Fish Kills in Lower Mississippi River, Atchafalaya River, and Gulf of Mexico, 82 pp., illus., processed, April 6, 1964. Division of Water Supply and Water Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

### FISH MEAL:

"Analytical tests on fish meal. IV--pepsin digestibility," by J. A. Lovern, article, *News Summary, International Association of Fish Meal Manufacturers*, no. 10, 1962, pp. 32-39, printed in English with French, German, and Spanish summaries. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

"Increased use of fish meal in South seen; layer, pet food use adds to consumption," article, *Feedstuffs*, vol. 36, January 25, 1964, pp. 63-64, printed, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

### FISH OILS:

"The composition of the component fatty acids of several fish oils," by S. Ito and K. Fukuzumi, article, *Yukagaku*, vol. 12, no. 5, May 1963, pp. 278-281, printed in Japanese with English abstract. Japan Oil Chemists' Society, Department of Applied Chemistry, Faculty of Engineering, University of Tokyo, Moto-fujicho, Bunkyo-ku, Tokyo, Japan.

"Isolation and structure of the eicosenoic, docosenoic, octadecatetraenoic, eicosapentaenoic and docosahexaenoic acid in skipper oil," by S. Ito and K. Fukuzumi, article, *Yukagaku*, vol. 12, no. 5, May 1963, pp. 272-

277, printed in Japanese with English abstract. Japan Oil Chemists' Society, Department of Applied Chemistry, Faculty of Engineering, University of Tokyo, Moto-fujicho, Bunkyo-ku, Tokyo, Japan.

### FISH PASTE:

"Manufacture of ready-to-serve/cook fish paste," by M. A. Krishnaswamy, K. R. Subbarao, and N. L. Lahiry, article, *Journal of Scientific and Industrial Research*, vol. 21D, no. 8, 1962, pp. 303-304, printed, *Journal of Scientific and Industrial Research*, Old Mill Rd., New Delhi 2, India.

### FISH POPULATIONS:

"The application of mathematical models to fish populations," by J. A. Gulland, article, *The Exploitation of Natural Animal Populations. A Symposium*, 1960, pp. 204-220, printed, 1962. John Wiley and Sons, Inc., 605 3rd Ave., New York, N. Y.

"Izmeneniya biologicheskikh svoistv populyatsii ryb i znachenie etikh izmenenii pri raschete promyslovogo prognoza" (Changes in biological characteristics of fish populations and significance of these changes in forecasting catches), by T. F. Dement'eva, article, *Referativnyi Zhurnal-Biologiya*, 1962, no. 23141, printed in Russian. *Referativnyi Zhurnal-Biologiya*, Akademiya Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

"Primeneniye variatsionnostatisticheskikh pokazatelei v issledovanii nekotorykh voprosov izmenchivosti v populyatsiyakh ryb" (Application of statistical indices of variation to the study of problems of variability of fish populations), by F. A. Turdakov, article, *Biological Abstracts*, vol. 43, no. 3, 1963, 8757, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

"O zakonomernostyakh rosta ryb i ikh znachenii v dinamike populyatsii" (Patterns of growth in fishes and their role in population dynamics), by N. I. Chugunova, article, *Trudy Soveshchaniia Komissii Akademii Nauk SSSR*, vol. 13, 1961, pp. 94-107, printed in Russian. *Izdatel'stvo Akademii Nauk SSSR*, Podolsenskiy per d. 21, Moscow B-64, U.S.S.R.

### FISH PROTEIN CONCENTRATE:

"Fish flour," article, *Report of the Fourth Inter-African Conference on Food and Nutrition*, Douala, Cameroun, 4-13 September 1961, p. 13, printed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

### FISH PUMPS:

"Studies on practical use of fish-pump. (1)," by H. Soeda, article, *Sogo-Kaiyokagaku*, vol. 5, March 1963, pp. 13-31, printed in Japanese. Muaruzen Co., Export Department, P. O. Box 605, Tokyo, Japan.

### FISH SCALES:

"A method for making fish scale impressions in the field or laboratory," by Robert C. Courtright, article, *Transactions of the American Fisheries Society*, vol. 93, no. 2, 1964, pp. 200-201, printed. American Fisheries Society, 1404 New York Ave. NW, Washington, D. C. 20005.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### FISH SOUNDS:

The Live Sounds of the Sea (Zhivyye Zvuki Morya), by N. I. Tarasov, Trans-152, 89 pp., illus., processed, 1963. (Translated from the Russian, Akademiya Nauk SSSR, Nauchno-Populyarnaya Seriya, 1960, 88 pp.) U.S. Naval Oceanographic Office, Washington, D. C. 20390.

#### FISHERY STOCKS:

Tables of the Incomplete Beta Function for the Calculation of Fish Population Yield, by N. J. Willimovsky and E. C. Wicklund, 291 pp., printed, 1963. Institute of Fisheries, University of British Columbia, Vancouver 8, B. C., Canada.

"Vplyv regulácie obsádok na ich ďalšie formovanie" (The effect of regulation of a stock upon its further development), by Ján Sedlár and others, article, Biological Abstracts, vol. 43, no. 3, 1963, 8741, printed. Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

#### FISHERY VOCATIONS:

Careers: Commercial Fishing in Louisiana, 20 pp., illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Discusses opportunities in Louisiana for fisheries careers; occupations connected with obtaining the product—biologist, chemist and biochemist, biological technician, seafood trawler owner, oyster fisherman, and boat captain; and occupations in processing fish—mechanical engineer, home economist, menhaden processor, and seafood handler. Also covers careers closely related to the industry—taxidermist, biological specimen supplier, salesman or marketer, shell processor, pet food manufacturer, supplier of fishing equipment, technical and sports writer, and other occupations.

#### FISHWAYS:

"Ob ispol'zovanii sudokhodnykh shlyuzov ges dlya propuska ryby iz nizhnego b'efa v vodokhranilishche" (Use of navigation locks at hydroelectric stations for the passage of fish from downstream into the reservoir), by Z. M. Kipper, article, Biological Abstracts, vol. 42, no. 6, 1963, 20619, printed. Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

#### FOOD AND AGRICULTURE ORGANIZATION:

Bulletin of Fishery Statistics, vol. 3--Catches in the North-East Atlantic, 1962, 71 pp., processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This Bulletin shows, as an advance release, the 1962 nominal catch data, by country and by species, according to fishing areas of the International Council for the Exploration of the Sea (ICES) Statistical Area. The summary tables cover the 14 principal fish species for which ICES collects monthly data.

Proceedings of the World Scientific Meeting on the Biology of Tunas and Related Species, FAO Fisheries Reports No. 6, vol. 2, 975 pp., processed, 1963. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Venezuela on the Development of the Marine Fisheries Research Program, by John G. Simpson, FAO Report No. 1606, 63 pp., illus., May 1963.

Report to the Government of Aden on the Crawfish Resources of Eastern Aden Protectorate, by R. W. George, FAO Report No. 1696, 26 pp., illus., June 1963.

First Report to the Government of Nigeria on Fishing Boats for Lake Chad, by Roland Andersson and Curt S. Ohlsson, FAO Report No. 1711, 62 pp., illus., 1963. Covers the work of a boatbuilder during 1963/64 and a preliminary survey team, assigned by the FAO to find the most suitable approach to the problem of boatbuilding for harvesting fish from Lake Chad. Largely composed of excellent black and white photos made during the survey.

(Guatemala) Informe al Gobierno de Guatemala sobre Recursos de Camarones (Report to the Government of Guatemala on Shrimp Resources), by Harold C. Loesch, FAO Report No. 1721, 9 pp., processed in Spanish, 1963.

#### FRANCE:

"Douze mois de pêche à Boulogne" (Twelve months of fishing at Boulogne), article, France Pêche, no. 82, March 1964, pp. 15-21, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents). France Pêche, Boîte Postale 179, Lorient, France.

"Rapport moral sur l'activité du Comité Central des Pêches Maritimes pendant l'année 1963, présenté par J. S. Parquic, Président du Comité Central des Pêches Maritimes" (Comprehensive report on the activities of the Comité Central des Pêches Maritimes during the year 1963, presented by J. R. Parquic, President of the Committee), by J. S. Parquic, article, France Pêche, no. 84, May 1964, pp. 49-54, 57-58, 61-67, 69, 71-81, 85-87, 88, 91-92, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents). France Pêche, Boîte Postale 179, Lorient, France.

"Les résultats comparés de la pêche en France en 1963 (Data on France's fishing industry for 1963)," article, France Pêche, no. 82, March 1964, pp. 23-24, printed in French, single copy 2.50 F. (about 52 U.S. cents). France Pêche, Boîte Postale 179, Lorient, France.

#### FREEZE-DRYING:

"Studies on the storage of dehydrated food by freeze-drying. 3--Changes of carotenoid and fat in freeze-dried tomato, carrot, and oyster," by S. Kimura and K. Shioda, article, Nihon Shokuhin-kogyo Gakkai-shi, vol. 10, no. 5, May 1963, pp. 169-174, printed in Japanese, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

Sublimatsionnaya Sushka Pishchevikh Produktov (Freeze-Drying of Food Products), by A. K. Kamnarskaia, S. A. Livshits, and Y. A. Olenov, 52 pp.,

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance

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illus., printed in Russian, 1963, 22 Kopecks (about 25 U.S. cents). Gosudarstvennoe Izdatel'stvo Torgovoi Literatury, Moscow, U.S.S.R. Discusses present status of the freeze-drying process; construction of the apparatus used; raw materials, quality control of products, research methods; and drying of meat and fish. Also covers in detail drying of fish preparations, storage of freeze-dried fish and fish preparations, and other related topics.

--Milan A. Kravzja

#### FRESH-WATER FISHERIES:

"Nekotorye voprosy teorii akklimatizatsii presnovodnykh ryb" (Some aspects of the theory of acclimatization of fresh-water fish), by E. V. Burmakina, article, *Zoologicheskii Zhurnal*, vol. 40, no. 9, 1961, pp. 1385-1394, printed in Russian. Redaktsia Zoologicheskogo Zhurnala, Podosenskiy per. d. 21, Moscow B-64, U.S.S.R.

"Osnovnye zadachi razvitiya ozernogo rybnogo khozaystva v SSSR" (The development of the lake fishing industry in the U.S.S.R.), article *Biological Abstracts*, vol. 44, no. 2, 1963, 4907, printed, *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

#### FROGS:

"Bull frogging in Louisiana," article, *Louisiana Conservationist*, vol. 14, nos. 7 and 8, July-August 1964, pp. 14-15, illus., printed, *Louisiana Wild Life and Fisheries Commission*, 400 Royal St., New Orleans, La. 70130. Covers the significance of the Louisiana bullfrog to the gourmet, to the commercial frogger, to the student of zoology, and to the sportsman. Discusses the methods of catch, frog metamorphosis, and the gradual disappearance of the once ideal Louisiana frog habitat because of drainage, flood control, and lake building.

#### FROZEN FISH:

"Basic quality changes in frozen seafood," by W. J. Dyer, article, *ASHRAE Journal*, vol. 6, January 1964, pp. 77-78, printed, *American Society of Heating, Refrigerating and Air-Conditioning Engineers*, 62 Worth St., New York, N. Y. 10013.

"Individually frozen fish fillets," by W. R. Lang, article, *Food Manufacture*, vol. 38, December 1963, pp. 667-669, printed, *Leonard Hill, Ltd.*, Stratford House, 9 Eden St., London NW1, England.

"Time-temperature tolerance of frozen seafood," by John A. Peters, article, *ASHRAE Journal*, vol. 6, January 1964, p. 77, printed, *American Society of Heating, Refrigerating and Air-Conditioning Engineers*, 62 Worth St., New York, N. Y. 10013.

"Water-thawing of frozen cod blocks," by W. A. MacCallum and D. G. Ellis, article, *Journal of the Fisheries Research Board of Canada*, vol. 21, January 1964, pp. 115-131, printed, *Queen's Printer and Controller of Stationery*, Ottawa, Canada.

#### GAR:

*The Alligator Gar*, by Victor W. Lambou, *Wildlife Education Bulletin* No. 30, 7 pp., illus., printed, 1962. (Reprinted from *Louisiana Conservationist*, January 1956.) *Louisiana Wild Life and Fisheries Commission*, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130.

#### GEAR:

"An acoustically telemetering depth gauge," by M. J. Tucker and others, article, *Deep-Sea Research*, vol. 10, no. 4, 1963, pp. 471-478, illus., printed, *Pergamon Press*, 122 E. 55th St., New York, N. Y. 10022.

#### GERMAN FEDERAL REPUBLIC:

*Die Bedeutung der Fischwirtschaft für die Volkswirtschaft der Entwicklungsländer und deren Förderung durch die Bundesrepublik Deutschland* (The Significance of the Fish Industry in the Economies of Developing Nations and their Assistance from the Federal Republic of Germany), by Dr. Werner Becker, 30 pp., illus., printed in German. (Reprinted from *Berichte über Landwirtschaft*, vol. 42, 1964, pp. 119-148.) Verlag Paul Parey, Spitalerstrasse 12, 2000 Hamburg 1, Germany.

"A Cuxhaven second port de pêche allemand: 90% du poisson frais fileté et un prix placher" (At Cuxhaven, Germany's second fishing port: 90 percent of the fresh fish is filleted and a floor price), article, *France Pêche*, no. 84, May 1964, pp. 123-126, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents). *France Pêche*, Boite Postale 179, Lorient, France.

#### GRAYLING:

*Life History and Migratory Patterns of Arctic Grayling*, Research Report No. 2, processed, 1963, Department of Fish and Game, Support Bldg., Juneau, Alaska.

#### GREAT SLAVE LAKE:

*Description of Great Slave Lake Commercial Fishing Vessels in 1963*, by J. J. Keleher, Manuscript Reports of the Great Slave Lake Investigation No. 32, 39 pp., printed, 1964, *Biological Station, Fisheries Research Board of Canada*, London, Ont., Canada.

#### GUATEMALA:

*Foreign Trade Regulations of Guatemala*, by Rodney D. Anderson, OBR 64-50, 8 pp., printed, May 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The report discusses trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries.

#### HAKE:

*Estadística de la Pesca de la Merluza en el Año 1962, Según Áreas de Captura* (Fishery Statistics of the Hake, 1962, by Catch Area), 15 pp., illus., processed in Spanish, 1964, Dirección General de Pesca y Conservación de la Fauna, Departamento de Investigaciones Pesqueras, Secretaría de Estado de Agricultura y Ganadería, Buenos Aires, Argentina.

#### HALIBUT:

*Regulation and Investigation of the Pacific Halibut Fishery in 1963*, Report of the International Pacific Halibut Commission No. 34, 24 pp., illus., printed, 1964. International Pacific Halibut Commission, Fisheries

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Hall No. 2, University of Washington, Seattle 5, Wash. A report of the accomplishments of the Commission during 1963 including historical background, activities during the year, 1963 regulations, and statistics of the fishery. Also covers composition of the catches, tagging experiments, studies of halibut below commercial size, and trawl survey of demersal species off the southern coast of central and western Alaska.

#### HERRING:

"Chemical studies on the herring (*Clupea harengus*). VIII--Further observations on the production of carbonyls in heat-processed herring," by R. B. Hughes, article, *Journal of the Science of Food and Agriculture*, vol. 14, December 1963, pp. 893-901, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Selected Articles on Herring, OTS 63-11108, 45 pp., illus., processed, 1963, 50 cents. (Translated from the Russian, *Trudy Gosudarstvennogo Okeanograficheskogo Instituta*, vol. 1, no. 4, 1932, pp. 3-66.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

"Sootnoshenie rosta i polovogo zrelosti vesennerestryushchei salaki" (Correlation of growth and sexual maturation in spring-spawning herring (*Clupea harengus membras*), by L. A. Rannak, article, *Trudy Sovetskoye Khimicheskoye Komissii Akademii Nauk SSSR*, vol. 13, 1961, pp. 337-343, printed in Russian. Izdatel'stvo Akademii Nauk SSSR, Podmosenskij per. d. 21, Moscow B-64, U.S.S.R.

"A study on the method of prediction of the Hokkaido spring herring resources," by N. Hanamura, article, *Suisan-cho Hokkaido-ku Suisan Kenkyujo Kenkyu Hokoku*, vol. 26, March 1963, pp. 1-66, printed in Japanese with English abstract. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

#### HORMONES:

A Convenient Technique for Obtaining Pituitary Glands from Fish, by H. Tsuyuki, P. J. Schmidt, and M. Smith, Reprint No. 768, 3 pp., illus., printed. (Reprinted from *Journal of the Fisheries Research Board of Canada*, vol. 21, no. 3, 1964, pp. 635-637.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### HUNGARY:

"Production drive in Hungary," article, *Fishing News International*, vol. 3, no. 2, April-June 1964, pp. 113-114, 116, illus., printed, single copy 6s. 6d. (about 90 U.S. cents). Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

#### ICHTHYOLOGY:

Copeia, no. 2, June 30, 1964, 212 pp., illus., printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif. Includes, among others, articles on: "Mass spawning behavior of sockeye salmon in Brooks River, Alaska," by Wilbur L. Hartman, Theodore R. Merrell, Jr., and Richard Painter; "*Carcharhinus floridanus*, the silky shark, a synonym of *C. falciiformis*," by

J.A.F. Garrick, Richard H. Bachus, and Robert H. Gibbs, Jr.; "An experimental study of the effect of temperature on the incubation time, development, and growth of Pacific sardine embryos and larvae," by Reuben Lasker; "Instrumental conditioning of young sharks," by Timothy Wright and Robert Jackson; "The pelagic eggs and early larval stages of the black drum from Chesapeake Bay," by Edwin B. Joseph, William H. Massmann, and John J. Norcross; "Observations on dolphins (*Coryphaena* sp.) in the central Pacific Ocean," by Brian J. Rothschild; and "Occurrence of the Pacific bonito in coastal Alaskan waters," by Jay C. Quast.

#### INDIAN OCEAN:

"Kratkie itogi rabot vtoroi Indookeanskoi ekspeditsii AZCHERNIRO" (Brief notes on activities of the second expedition of the Azov-Black Sea Marine Fisheries Research Institute in the Indian Ocean), by B. S. Solov'ev, article, *Okeanologiya*, vol. 3, no. 5, 1963, pp. 936-938, illus., printed. *Okeanologiya*, Akademiya Nauk SSSR, Moscow, U.S.S.R.

Oceanographic Stations Taken in the Indian Ocean by U.S.C.G.C. EASTWIND (WAGB-279) in 1961, by Willis L. Tressler, N.O.O. Tr. 141, 84 pp., printed, July 1963, 75 cents. Naval Oceanographic Office, Washington 25, D. C.

#### INTERNATIONAL COMMISSIONS:

North-East Atlantic Fisheries Commission, Report of the First Meeting, September 1963, 16 pp., processed in French and English, 1964. North-East Atlantic Fisheries Commission, Rm. 617, East Block, Whitehall Pl., London SW1, England. Contains a report of the proceedings of the first meeting of the newly formed North-East Atlantic Fisheries Commission, London, September 18-20, 1963. Commissioners were present from all Contracting States: Belgium, Denmark, Federal Republic of Germany, France, Iceland, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, U.S.S.R., and the United Kingdom. The Commission elected officers, adopted Rules of Procedure, appointed an Infractions Committee and a Finance Committee, approved a budget for the current financial year, and established Regional Committees for each of the three regions into which the Convention area is divided. The Commission made plans to hold its second meeting in The Hague, May 12, 1964.

Proces-Verbal de la Reunion, 1963 (Report on the 1963 Meeting), 108 pp., illus., processed, 1964. Conseil International pour l'Exploration de la Mer (I.C.E.S.), Charlottenlund Slot, Charlottenlund, Denmark. Contains information on the 51st Meeting of the Council at Madrid, September-October 1963. Report gives lists of participants and committees; agenda, general meetings, resolutions passed; budget for 1963/1964; and recommendations of consultative committee. In addition, included are the reports of the various committees: Editorial; District Northern Seas; Near Northern Seas; Baltic-Belt Seas; Comité Atlantique; Comparative Fishing (and appendix, "Report of Symposium on the Measurement of Fish Stocks"); Gadoid Fish; Herring (and appendix, "Interim Report of the Working Group on the Assessment of Herring Fisheries in Near Northern Seas"); Comité de la Sardine; Salmon and Trout; Shellfish; Statistical; and others.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

## JAPAN:

"Aquatic products industry," article, Japanese Industry 1963, pp. 143-146, illus., printed, The Foreign Capital Research Society, c/o The Bank of Japan, Hongoku-cho, Nihonbashi, Chuo-ku, Tokyo, Japan. Fish and marine products in 1962 in Japan increased 2 percent over the previous year to 6,86 million tons (exclusive of the whaling branch), setting a new record. Yet the fisheries accounted for only 2.3-2.5 percent of gross national income in 1961. Nevertheless, the fishery production index in 1962, taking 1950-52 averages as 100, showed a remarkable rise to 205.7. Exports of perishable fish and shellfish in 1962 totaled \$83 million, a broad increase of 36 percent over the previous year. Pearl exports for the same year increased 17 percent over those of the previous year to \$41.8 million. This article, besides reviewing the history of the Japanese fishing and related industries, includes statistical tables showing landings of fish, shellfish, and aquatic plants; the whale catch; numbers of powered fishing vessels; ice plants, cold storage, and refrigeration plants; and exports of aquatic products.

## LAKE ERIE:

Limnological Survey of Lake Erie, 1959 and 1960, by Alfred M. Beeton, Technical Report No. 6, 32 pp., printed, 1963, Great Lakes Fishery Commission, Ann Arbor, Mich.

## LAKE TROUT:

"The accumulation of DDT in lake trout and the effect on reproduction," by G. E. Burdick and others, article, Transactions of the American Fisheries Society, vol. 93, no. 2, 1964, pp. 127-136, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

## LIGHT ATTRACTION:

"O prirode i mekhanizme reaktivii ryb na iskusstvennyi svet (predvarit. soobshchenie)" (The nature and mechanism of fish reactions to artificial light--(preliminary report), by V. R. Protasov and Yu. P. Alukhov, article, Trudy Karadagsk., vol. 17, 1961, pp. 3-6, printed in Russian, Biological Station, Akademii Nauk, Ukrainian S.S.S.R.

## LIPIDS:

"The change of the lipid system in fish meat at several treating and manufacturing courses," by K. Miwa, article, Suisan-cho Hokkaido-ku Suisan Kenkyujo Kenkyu Hokoku, vol. 26, March 1963, pp. 129-134, printed in Japanese with English abstract, Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

## MACKEREL:

"A study on the migration of the mackerels (*Scomber japonicus* and *S. tapeinocephalus*) based on tagging experiments in the East China Sea," by N. Ogawa and others, article, Seikai-ku Suisan Kenkyujo Kenkyu Hokoku, vol. 28, March 1963, pp. 25-47, printed in Japanese with English abstract, Seikai Regional Fisheries Research Laboratory, Suisan-cho Seikai-ku, Suisan Kenkyusho, Maruo-Machi, Nagasaki-shi, Japan.

"Studies on the movement of shoals of mackerel and its environmental factors. 2--The relationship be-

tween the floating-up of mackerel shoals in the bay of Ishikari, Hokkaido and the environmental factors," by T. Kawakami, article, Nihon Suisan Gakkai-shi, vol. 29, no. 5, May 1963, pp. 415-420, printed in Japanese with English abstract, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

## MALAYSIA:

Preliminary Bibliography of Fish and Fisheries for Malaysia, compiled by A. Soulier, Occasional Paper 63/13, 33 pp., printed, 1963, Indo-Pacific Fisheries Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Malayan Mason, Phra Atit Rd., Bangkok, Thailand.

## MAPS:

Ocean Fishing Map of Monterey and San Luis Obispo Counties, 2 pp., illus., printed, 1964, Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif. 95814. A summary of ocean sport fishing, including a listing of fishing areas, kinds of fish caught, best times of year to fish, and gear and bait to use.

## MARINE FOULING:

On the Methods of Studying Marine Fouling of Seagoing Ships and Hydrotechnical Structures, by N. I. Tarasov and N. A. Rudyakova, 5 pp., printed, (Translated from the Russian, Trudy Instituta Okeanologii, vol. 49, 1961, pp. 60-64.) U.S. Naval Oceanographic Office, Washington 25, D. C.

## MEXICO:

"El mar y las industrias maritimas, factor primordial de desarrollo en el gran futuro economico de Mexico" (The sea and the marine industries, primary development factor in the great economic future of Mexico), article, Novedades, March 15, 1964, Mexico en la Cultura section, pp. 1-4, illus., printed in Spanish, "Novedades," Mexico, D. F., Mexico.

## MONTANA:

"A preliminary list of Montana fishes," by C. J. D. Brown, article, Proceedings of the Montana Academy of Sciences, vol. 22, 1962, pp. 21-26, printed, Montana Academy of Sciences, Montana State University, Missoula, Mont.

## NETS:

"The fishing of trawls and seines. 2," by A. R. Margetts, article, World Fishing, vol. 13, January 1964, pp. 48-49, printed, John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London, NW1, England.

"Mechanical gill net hauler," by Frank Dopplinger, article, Trade News, vol. 16, no. 11, May 1964, pp. 4-5, illus., processed, Director of Information and Educational Service, Department of Fisheries, Ottawa, Canada. Reports primarily on Canada's Department of Fisheries recently developed mechanical gill-net hauler designed to meet the needs of the ever-increasing number of small inshore fishing vessels.

"Methods of preservation of cotton net twines," by G. K. Kuriyan and S. G. Nayar, article, IPFC Current Affairs Bulletin, no. 38, December 1963, pp. 6-8, printed, Indo-Pacific Fisheries Council, Food and

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Agriculture Organization of the United Nations, Ma-lian Mansion, Phra Atit Rd., Bangkok, Thailand.

"A small towed net for ocean surface sampling," by R. P. Willis, article, *New Zealand Journal of Science*, vol. 6, no. 1, 1963, pp. 120-126, printed, Department of Science and Industrial Research, Box 8018, Wellington, New Zealand.

#### NEW JERSEY:

*Annual Report of the Division of Fish and Game for the Fiscal Year Commencing July 1, 1962 and Ending June 30, 1963*, 63 pp., printed, 1963, Department of Conservation and Economic Development, Trenton, N. J.

#### NIGERIA:

*Basic Data on the Economy of Nigeria*, by A. A. Wilken, OBR 64-47, 20 pp., illus., printed, April 1964, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Nigeria is located on the west coast of Africa facing southward on the Gulf of Guinea and is roughly equal in size to California, Oregon, and Nevada combined. She is the most populous country in Africa, having an estimated population of 40 million people in mid-1963. The report contains information on Nigeria's Government, structure of the economy, industrial sectors, and the labor force. Also covers finance, foreign trade, Government role in the economy; and outlook for the economy. The potential for development of the fishing industry seems strong, according to this report. The 6-Year Plan includes several projects aimed at developing the fishing industry both along the coast and in inland areas. Rivers contain Niger perch which sometimes weigh as much as 50 pounds.

#### NORTHEASTERN PACIFIC:

*Management of the High Seas Fisheries of the Northeastern Pacific*, by Richard Van Cleave, Publications in Fisheries, New Series, vol. 2, no. 2, 63 pp., printed, 1963, University of Washington, Seattle, Wash.

#### NORTHWEST ATLANTIC FISHERIES COMMISSION:

*The Selectivity of Fishing Gear*, Special Publication No. 5, 225 pp., illus., printed, 1963, International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada. This is Volume 2 of Proceedings of Joint I.C.N.A.F./I.C.E.S./F.A.O. Special Scientific Meeting held at Lisbon, 1957. Contains papers and abstracts of papers given at that meeting. Includes, among others, the following: "The influence of behaviour on the capture of fish with baits," by K. R. Allen; "The selective action of nets made of manila, hemp and nylon," by J. Ancellin and P. Desbrosses; "Escape of fish through different parts of a cod-end," by R. J. H. Beverton; "A method for determining gear selectivity and its application," by S. J. Holt; "An illustration of differing selectivities in two trawls," by A. R. Margetis; "Results on the effects of using small-mesh covers; effects on the catches of the escape sizes of fish," by B. B. Parrish and J. A. Pope; "Sampling catches at sea," by J. A. Pope; "Selectivity of long lines," by G. Saetersdal; "The stretch on net meshes," by W. Strzyzewski and J. Zaucha; and "On the selectivity of trawls and driftnets," by A. Treschev.

#### NORWAY:

"La industria Noruega de conservas de pescado en 1963" (Norway's fish canning industry in 1963), article, *Industria Conservera*, vol. 30, no. 297, March 1964, printed in Spanish, *Industria Conservera*, Calle Marques de Valladares, 41, Vigo, Spain.

#### OCEANOGRAPHIC GEAR:

"An expendable bathythermograph," by Robert A. Rasmussen, article, *Journal of Marine Research*, vol. 21, no. 3, 1963, pp. 304-316, illus., printed, Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn.

#### OCEANOGRAPHY:

"Compilacion bibliografica sobre la oceanografia de las aguas litorales de Colombia, Ecuador y Peru, con especial referencia al fenomeno 'El Nino'" (Bibliographic compilation on the oceanography of the coastal waters of Colombia, Ecuador, and Peru, with special reference to the "El Nino" phenomenon), by Malvern Gilmartin, article, *Boletin Cientifico y Tecnico*, vol. 1, no. 1, January 1964, pp. 1-15, printed in Spanish and English, Instituto Nacional de Pesca del Ecuador, Ministerio de Fomento, Guayaquil, Ecuador. The first issue of a new periodical published by the National Fisheries Institute of Ecuador and dedicated to scientific papers concerning the western coast of South America.

*Contributions of the Scripps Institution of Oceanography*, 1962, 1515 pp., printed, 1963, Scripps Institution of Oceanography, La Jolla, Calif.

"Drift bottle modifications for air drops," by Gerald B. Talbot, article, *Transactions of the American Fisheries Society*, vol. 93, no. 2, 1964, pp. 203-204, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

*The Dynamic Method in Oceanography*, by L. M. Fomin, 224 pp., illus., printed, 1964, \$12, Elsevier Publishing Co., 52 Vanderbilt Ave., New York, N. Y. 10017.

*This Great and Wide Sea: an Introduction to Oceanography and Marine Biology*, by Robert E. Coker, 340 pp., illus., printed, 1962, Harper and Bros., 49 E. 33rd St., New York, N. Y. 10016.

*Oceanographic Cruise USCGC "Northwind," Bering and Chukchi Seas, July-Sept., 1962*, United States Coast Guard Oceanographic Report No. 1 (CG-373-1), 111 pp., illus., printed, 1964, \$1.50, United States Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

"Veroeffentlichungen des Instituts fur Meeresforschung in Bremerhaven, Sonderband--Drittes Meresbiologische Symposium 23, bis 25. Oktober 1962 in Bremerhaven" (Publications of the Institute of Oceanology in Bremerhaven, Supplement--Third Marine Biological Symposium, October 23-25th, 1962, in Bremerhaven), edited by W. Hohnk, article, *Biological Abstracts*, vol. 44, no. 1, 1963, 525, printed, *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

#### OCEAN PERCH:

*ICES/ICNAF Redfish Symposium*, Special Publication No. 3, 311 pp., printed, 1964, C\$11.25, International



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Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N.S., Canada. The report of the International Redfish Symposium, Copenhagen, October 1959. Contains 34 complete papers, 10 abstracted papers, and a comprehensive bibliography of literature on *Sebastes* in addition to summary reports of the chairman and reports by the discussion leaders for each of the five sections.

#### OTOLITHS:

"Determining the age of young herring from their otoliths," by John E. Watson, article, *Transactions of the American Fisheries Society*, vol. 93, no. 1, 1964, pp. 11-20, illus., printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

#### OYSTERS:

*Investigations of the Oyster Beds in Loch Ryan*, by R. H. Millar, Marine Research 1963 No. 5, 27 pp., illus., printed, 1963, 7s. 6d. (about US\$1.05). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.

*The Louisiana Oyster Story*, by Ednard Waldo, *Wildlife Education Bulletin* No. 32, 11 pp., illus., printed, 1962. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. "The innocuous oyster which can neither fight nor run has somehow taken its place with the great in the recorded pages of history..." states the author. This pamphlet covers the oyster's history as a food, its biological functions, and some ways to cook it.

"L'Ostreiculture Charentaise à un tournant de son histoire" (The oyster culture industry of Charente at a turning-point in its history), article, *France Pêche*, no. 83, April 1964, pp. 15-22, 60, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents). France Pêche, Boîte Postale 179, Lorient, France.

#### PELAGIC FISH:

"Nekotorye osobennosti raspredelnii massovykh pelagicheskikh ryb v zone ekvatorial'nykh tekhenii Tikhogo okeana (Po materialam 34-go reisa e/s Vityaz') (Some features of the distribution of common pelagic fishes in the region of the equatorial currents of the Pacific Ocean--according to data gathered during the 34th cruise of the expedition ship Vityaz'), by N. V. Parin, article, *Referativnii Zhurnal-Biologiya*, 1963, No. 15137 (translation), printed. Referativnii Zhurnal-Biologiya, Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

"Rezultaty izucheniya pelagicheskoi ikhtiofauny Tikhogo i Indiskogo okeanov pri pomoshchi elektricheskogo sveta" (Data on the pelagic fish fauna of the Pacific and Indian Oceans obtained by the use of electric lights), by N. V. Parin, article, *Referativnii Zhurnal-Biologiya*, 1963, No. 15136 (translation), printed. Referativnii Zhurnal-Biologiya, Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

#### PERU:

*Las Exportaciones de Productos Pesqueros (Exports of Fishery Products)*, by Javier Iparraguirre Cortez, *Serie de Divulgacion Cientifica* 21, 62 pp., illus., printed in Spanish, July 1963. Servicio de Pesqueria, Ministerio de Agricultura, Lima, Peru. Data are mostly for 1962 with comparisons for previous years.

"A survey of Peruvian fishing communities," E. A. Hammel and Ynez D. Haase, article, *Anthropological Records*, vol. 21, no. 2, 1962, pp. 211-229, illus., printed. University of California Press, Berkeley, Calif.

#### PESTICIDES:

"Persistence of DDT and its metabolites in a farm pond," by W. R. Bridges, B. J. Kallman, and A. K. Andrews, article, *Transactions of the American Fisheries Society*, vol. 92, no. 4, 1963, pp. 421-427, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

#### PHYSIOLOGICAL CHEMISTRY:

"Studies on the physiological chemistry of phosphorus compounds in fish muscle. XI--Effect of loading on the activity of myosin-B ATP-ASE in Gibel," by Tomoo Nakano and Tsuchiya Yasuhiko, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, December 1962, pp. 1184-1187, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigan-dori 6, Minato-ku, Tokyo, Japan.

#### PHYSIOLOGY:

"The biology of sound-producing fishes," by N. B. Marshall, article, *Symposia of the Zoological Society of London*, vol. 7, 1962, pp. 45-60, printed. Zoological Society of London, Regent's Park, London, England.

"The speed of swimming fish as related to size and to the frequency and amplitude of the tail beat," by R. Bainbridge, article, *Journal of Experimental Biology*, vol. 35, 1958, pp. 109-133, illus., printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

#### Techniques for the Investigation of Fish Physiology

(Rukovodstvo po Metodike Issledovaniya Fiziologii Ryb), edited by E. N. Pavlovskii, OTS 64-11001, 317 pp., illus., processed, 1964, \$3.25. (Translated from the Russian; Akademiia Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, 1962.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### POLAND:

*Zootechnika*, zeszyt 2, rybactwo 1, 1960, 115 pp., illus., printed in Polish. Zeszyty Naukowe, Szkoły Główniej Gospodarstwa Wiejskiego w Warszawie, Warsaw, Poland. Contains articles on ichthyology.

#### POLLLOCK:

"Changes in muscle protein of Alaska pollack during storage in ice," by T. Tokunaga, article, *Suisan-cho Hokkaido-ku Suisan Kenkyujo Kenkyu Hokoku*, vol. 26, March 1963, pp. 135-142, printed in Japanese with English abstract. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### POLLUTION:

"The biological effects of synthetic detergents in the river Lee, Hertfordshire," by H.B.N. Hyndes, article, *Biological Abstracts*, vol. 42, no. 6, 1963, 20536, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

"Development of water quality criteria for aquatic life," by C. M. Tarzwell, article, *Journal of Water Pollution Control Federation*, vol. 34, no. 11, 1962, pp. 1178-1185, printed. *Water Pollution Control Federation*, 4435 Wisconsin Ave., Washington, D. C.

Pollution-Caused Fish Kills in 1963, Public Health Service Publication No. 847, 31 pp., printed, 1964, 25 cents. Public Health Service, U.S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents data on pollution-caused fish kills by State, source of pollution, type of water, month, severity of damage, and others; and cumulative listing of reports by river or lake affected.

"Pollution effects of agricultural insecticides and synthetic detergents," by Tom D. Reynolds, article, *Biological Abstracts*, vol. 42, no. 5, 1963, 18833, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

Water Pollution--in the Past and in the Sixties, by Kenneth E. Biglane, *Wildlife Education Bulletin* No. 24, 7 pp., illus., printed, 1962. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Reviews the history of water pollution and efforts towards its control. Most authorities agree that those deeds accomplished in the pollution control field during the 1960's will have far reaching effects on the health and welfare of our country for the next 20 years, states the author.

#### POLLUTION CONTROL:

The Position of the Food and Agriculture Organization with Respect to Water Pollution Control, by William A. Dill, FAO Fisheries Biology Technical Paper No. 34, 14 pp., processed, June 1963, distribution restricted. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

#### PORTUGAL:

Comércio Externo. Volume I--Comércio por Mercadorias e Países, 1963 (Foreign Commerce, Volume I--By Commodity and Country), 577 pp., illus., printed in Portuguese and French, 1964, 130 Escudos (about US\$4.52). Instituto Nacional de Estatística, Lisbon, Portugal. Contains details, among other commodities, on imports and exports of fishery products.

Grémio dos Armadores da Pesca da Baleia, Relatório e Contas do Exercício de 1963 e Orçamento para 1964 (Whaling Vessel Owners' Guide, Report of Operations in 1963 and Budget for 1964), 37 pp., printed in Portuguese, February 1964. Comissão Revisora de Contas, Lisbon, Portugal.

Estatística das Pescas Marítimas no Continente e Ilhas Adjacentes no Ano de 1962 (Statistics of Marine Fish-

eries on the Continent and Adjacent Islands, 1962), 143 pp., printed in Portuguese, 1963. Direcção das Pescarias, Ministério da Marinha, Lisbon, Portugal.

#### PRESERVATION:

"Studies on the preservation of marine products. 7 and 8--Microbiological survey of frozen 'surimi,'" by M. Sasajima and others, article, *Suisan-cho Hokkaido-ku Suisan Kenkyujo Kenkyu Hokoku*, vol. 26, March 1963, pp. 118-128, printed in Japanese with English abstract. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"O zamene obzharki ryby v masle obrabotkoi goryachim vozdukhom pored konservirovaniem" (On the replacement of frying in oil by treatment with hot air before preserving), by B. E. Akimova, article, *Izvestia Vysshikh Uchebnykh Zavedenii Pishchevaya Tekhnologiya*, vol. 3, 1963, pp. 92-95, illus., printed in Russian. Izdatel' Krasnodarskogo Instituta Tishchevoi Promyshlennosti, U1, Krasnaya, 135, Krasnodar, U.S.S.R.

#### PROTEIN:

"Fish muscle proteins," by J. J. Connell, article, *Recent Advances in Food Science*, pp. 136-146, printed, 1962. Butterworth & Co. Ltd., Bell Yard, Temple Bar, London WC2, England.

#### QUALITY:

"Rancidity of fresh and frozen fish," by F. Bramsnaes and P. Hansen, article, *Chemical Abstracts*, vol. 59, September 2, 1963, 5695g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Some aspects of the problem of quality control in the fish industry," by C. L. Cutting and G. H. O. Burgess, article, *Society of Chemical Industry Monograph*, No. 8, pp. 59-77, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

#### RADIOACTIVE ISOTOPES:

"Izuchenie biologicheskoi produktivnosti vodoemov pri pomoshchi radioizotopov" (A study of the biological productivity of bodies of water using radioactive isotopes), by V. I. Zhadin, A. G. Rodina and A. S. Troshin, article, *Biological Abstracts*, vol. 44, no. 3, 1963, 9328, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

#### RED TIDE:

"Mass mortality of marine organisms attributed to the 'Red Tide' in Southern California," by Donald J. Reish, article, *California Fish and Game*, vol. 49, no. 4, 1963, pp. 265-270, printed. Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif. 95814.

"The red tide," by Arthur H. Bryan, article, *American Biology Teacher*, vol. 25, no. 1, 1963, pp. 53-54, printed. National Association of Biology Teachers, Bryan, Ohio.

#### REFRIGERATION:

"Refrigeration in the fisheries industry," by Hadden F. Taylor, article, *ASHRAE Journal*, vol. 6, January 1964, p. 76, printed. American Society of Heating, Refrigerating and Air-Conditioning Engineers, 62 Worth St., New York, N. Y. 10013.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

## ROCKFISH:

"A contribution to the biology of the black rockfish, *Sebastes inermis* Cuvier et Valenciennes," by E. Harada, article, *Publications of the Seto Marine Biological Laboratory*, vol. 10, no. 2, December 1962, pp. 307-361, Seto Marine Biological Laboratory, Kyoto University, Seto, Japan.

"Growth and maturity of the common rockfish, *Sebastes marmoratus* Cuvier et Valenciennes," by T. Shiokawa, article, *Records of Oceanographic Works in Japan*, Spec. vol. 6, December 1962, pp. 91-102, Japanese National Commission for UNESCO, 4-3 Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

## ROUGH FISH:

"Three seasons of rough fish removal at Norris Reservoir, Tennessee," by Billy B. Carroll and Gordon E. Hall, article, *Transactions of the American Fisheries Society*, vol. 92, no. 4, 1963, pp. 356-364, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

## SALMON:

"Ob adaptivnom znachenii stroeniya nerestovykh bugrov lososей roda *Oncorhynchus*" (The adaptive significance of the structure of spawning redds in salmon of the genus *Oncorhynchus*), by I. S. Vasil'ev, article, *Biological Abstracts*, vol. 44, no. 3, 1963, 9320, printed, Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

"Biokhimicheskie izmeneniya organizma molodi lososya pri perekhode v pokatnoe sostoyanie" (Biochemical changes in the bodies of young salmon--Piscis--during their downstream migration), by E. M. Malikova, article, *Referativnyi Zhurnal-Biologiya*, 1962, no. 20179, printed in Russian, Akademii Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

"O biologii primorskoi gorbushi *Oncorhynchus gorboscha* (Walbaum)" (On the biology of the pink salmon of the Maritime Province, *Oncorhynchus gorboscha* Walbaum), by O. V. Vasilenko-Lukina, article, *Voprosy Ikhtologii*, vol. 2, no. 4, 1962, pp. 604-608, printed in Russian, Akademia Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, U.S.S.R.

"Blood types in Pacific salmon," by George J. Ridgway and George W. Klontz, article, *Bulletin of the International North Pacific Fisheries Commission*, no. 5, pp. 49-55, printed, 1961, International North Pacific Fisheries Commission, 6640 N.W. Marine Dr., Vancouver 8, B.C., Canada.

Bristol Bay Red Salmon Forecast of Run for 1964, edited by Frank J. Ossander, Informational Leaflet 39, 43 pp., illus., processed, April 29, 1964, Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska. Discusses forecasts by rivers based on parent cycle escapements and smolt abundance; abundance of young salmon at sea; multiple regression prediction; and 1964 Bristol Bay forecast based on mathematical analyses. Data from enough years from both high-seas and fresh-water research are accumulating so that a multiple regression analysis now seems reasonable for separately predicting returning numbers of red salmon after 2-ocean and 3-ocean years.

"Chromosome morphology and species evolution in the five North American species of Pacific salmon (*Oncorhynchus*)," by Raymond C. Simon, article, *Journal of Morphology*, vol. 112, no. 1, 1963, pp. 77-97, printed, Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia, Pa.

"Consideration on the differences in body length, sex ratio and body weight in the pink salmon catches of long-line and gill-net of the Japanese land-based fisheries, with special reference to mesh selectivity," by T. Ishida, article, *Suisan-cho Hokkaido-ku Suisan Kenkyujo Kenkyu Hokoku*, vol. 26, March 1963, pp. 67-72, printed in Japanese with English abstract, Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"Decline of the Alaska salmon. A case study in resource conservation policy," by Richard Allen Cooley, article, *Dissertation Abstracts*, vol. 23, no. 2, 1962, pp. 686-687, printed, University Microfilms, University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"Ecological distribution of spawning sockeye salmon (*Oncorhynchus nerka*) in three lateral streams, Brooks Lake, Alaska," by David Townsend Hoopes, article, *Dissertation Abstracts*, vol. 42, no. 6, 20609, printed, University Microfilms, University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"Ecological studies on the land-locked Masu salmon, *Oncorhynchus masou* (Brevoort). (1) Ecological succession on the limnological conditions and feeding habit on the lake-locked form at Uryu reservoir, M. Osanai, article, *Suisan Fukajo Kenkyu Hokoku*, vol. 17, December 1962, pp. 21-29, printed in Japanese, Hokkaido Salmon Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

The Exploitation, Scientific Investigation and Management of Salmon (Genus *ONCORHYNCHUS*) Stocks on the Pacific Coast of the United States in Relation to the Abstention Provisions of the North Pacific Fisheries Convention, Bulletin No. 10, 160 pp., printed, 1962, International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C. Canada.

Forecast of the Chignik River Red Salmon Run in 1964, by M. L. Dahlberg and others, Informational Leaflet No. 38, 4 pp., illus., processed, April 20, 1964, Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska.

"Formennye elementy krovi v razvitiі lososya" (The formed blood elements in the development of the salmon), by I. N. Ostroumova, article, *Trudy Soveshchaniya Ikhtologicheskaya Komissiya*, vol. 8, 1958, pp. 380-386, printed, Four Continent Book Corporation, 156 5th Ave., New York, N. Y.

High-Seas Salmon Fishing by Canadian Vessels in 1962, by F. Neave and others, Manuscript Report Series (Biological) No. 759, 59 pp., printed, 1963, Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., Canada.

"Iodine metabolism in adult king salmon (*Oncorhynchus tshawytscha*, Walbaum)," by Gilles La Roche and others.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ers, article, Proceedings of The XVI International Congress of Zoology, vol. 2, 1963, p. 154, printed, Permanent Committee of International Zoological Congresses, Secretary (Pierre Grasse), 105 Blvd. Raspail, Paris 6, France.

"Method used to distinguish between immature and maturing sockeye and chum salmon taken by Canadian exploratory fishing vessels in the Gulf of Alaska," by H. Godfrey, article, Bulletin of the International North Pacific Fisheries Commission, no. 5, pp. 17-25, printed, 1961. International North Pacific Fisheries Commission, 6640 NW, Marine Dr., Vancouver 8, B. C., Canada.

"The morphology of the olfactory organ of the Pacific salmon (*Oncorhynchus*)," by Wolfgang Pfeiffer, article, Canadian Journal of Zoology, vol. 41, no. 7, 1963, pp. 1233-1236, printed, Division of Administration, National Research Council, Sussex St., Ottawa 52, Canada.

"Opyt otsenki nekotorykh diet, primenyayushchikha dlya molodi baltiiskogo lososya, po dannym gistofiziologicheskogo analiza pecheni" (Evaluation of some diets used for Baltic salmon fry by means of histophysiological examination of the liver), by K. A. Faktorovich, article, Rybnoe Khoziaistvo, 1960, pp. 103-112, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

"Opyt prudovogo vyrashchivaniya molodi semgi, Baltiiskogo i Ozerhogo lososel do pokatnogo sostoyaniya" (Experience in the pond breeding of the young of Atlantic, Baltic, and lake salmon until the migratory state), by N. V. Evropeitseva, article, Referativnyi Zhurnal-Biologiya, 1962, no. 20187, printed in Russian. Referativnyi Zhurnal-Biologiya, Akademiia Nauk SSSR, Institute Nauchnoi-Informatsii, Moscow, U.S.S.R.

"Regular fluctuations in the annual abundance of Adams River race sockeye salmon and the operation of possible causal agents," by Fredrick James Ward, article, Dissertation Abstracts, vol. 23, no. 6, 1962, 2265, printed. University Microfilms, University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"On the reproduction curves and optimum escapements for the sockeye salmon stocks of the Skeena River, the Fraser River and Bristol Bay and the pink salmon stocks of Alaska," by Takayuki Doi, article, Bulletin of the International North Pacific Fisheries Commission, no. 10, pp. 155-160, printed, 1962. International North Pacific Fisheries Commission, 6640 NW, Maine Dr., Vancouver 8, B.C., Canada.

Salmon Fact Book, 42 pp., illus., processed, Canned Salmon Institute, 302 Colman Bldg., Seattle 4, Wash. This booklet traces the history of the salmon and describes both the catching and packing of "the king of canned fish." Also included are several pages of recipes for the preparation of salmon dishes, salads, and sandwiches.

"Some factors having effects on the behavior of salmon in the time of gill-netting," by K. Taguchi, article, Nihon Suisan Gakkai-shi, vol. 29, no. 5, May 1963, pp. 434-440, printed in Japanese with English

abstract, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

Spawning Ground Survey of Red Salmon Eggs and Larvae in Bristol Bay, 1963, by Michael L. Nelson, Informational Leaflet No. 40, 7 pp., illus., processed, May 8, 1964. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

"Two biological stains as markers for sockeye salmon fry," by F. J. Ward and L. A. Verhoeven, article, Transactions of the American Fisheries Society, vol. 92, no. 4, 1963, pp. 379-383, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

"Vliyanie gidrosooruzhenii na zapasy fsennykh promyslovyykh ryb i zadachi rybovodstva v novykh usloviyakh" (Effects of hydro-electric installations on commercially important fish stocks and objectives of fish management under the new conditions), by I. A. Barannikova, article, Rybnoe Khoziaistvo, vol. 36, 1960, pp. 92-103, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, Moscow, B-140, U.S.S.R.

#### SANITATION:

"Ultraviolet irradiation of circulating refrigerated fish storage brines," by J. W. Boyd and B. A. Southcott, article, Journal of the Fisheries Research Board of Canada, vol. 21, January 1964, pp. 37-43, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

#### SARDINES:

The Pilchard of South West Africa (SARDINOPS OCELANOTA), Sexual Development, Condition Factor and Reproduction 1957-1960, by J. P. Mathews, Investigation Report No. 10, 95 pp., illus., printed. Marine Research Laboratory, Administration of South West Africa, Windhoek, South West Africa.

"Preliminary report on the Marquesan sardine, *Haemulga vittata*, in Hawaii," by Thomas S. Hida and Robert A. Morris, article, Pacific Science, vol. 17, no. 4, 1963, pp. 431-437, illus., printed. Pacific Science, University of Hawaii, Honolulu 14, Hawaii.

#### SCALLOPS:

"Bay scallops as vigorous living filters," by Nelson Marshall, article, Maritimes, vol. 8, no. 2, Spring 1964, pp. 11-13, illus., printed. Graduate School of Oceanography, University of Rhode Island, Kingston, R. I.

#### SEA TROUT:

"Yield and proximate composition of sea-trout from southern Brazil," by K. Watanabe, article, Nihon Suisan Gakkai-shi, vol. 29, May 1963, pp. 475-481. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### SEAWEEDS:

"Some comments on the movement of the floating seaweeds," by S. Segawa and others, article, Records of Oceanographic Works in Japan, Spec. vol. 8, December 1962, pp. 153-159. Japanese National Commission for UNESCO, 4-3 Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### SENSORY ORGANS:

"Ekologicheskoe fizionologicheskoe osobennosti organov chuvstv nekotorykh ryb v svyazi s ikh pishchevymi reaktsiyami" (The ecological-physiological features of the sense organs of certain fish in relation to their reactions), by M. P. Aronov, article, Biological Abstracts, vol. 43, no. 1, 1963, 462, printed, Biological Abstracts, 3815 Walnut St., Philadelphia 4, Pa.

"Izuchenie zreniya ryb" (Study of vision in fish), by V. R. Protasov, article, Referativnyi Zhurnal-Biologiya, 1962, no. 1162, printed in Russian, Referativnyi Zhurnal-Biologiya, Akademiya Nauk SSSR, Institut Nauchno-Informatsii, Moscow, U.S.S.R.

"Metody issledovaniya slukha ryb" (Methods of studying hearing in fish), by G. A. Malukina, article, Referativnyi Zhurnal-Biologiya, 1962, no. 1163, printed in Russian, Referativnyi Zhurnal-Biologiya, Akademiya Nauk SSSR, Institut Nauchno-Informatsii, Moscow, U.S.S.R.

#### SHRIMP:

"Ecology of shrimps on the eel-grass bed. (1) *Spionocaris propinqua*. (2) *Leander macrodactylus* and others. (3) Shrimps in relation to their environment." by H. Kurata, article, Suisan-cho Hokkaido Kenyu Suisan Kenkyu Hokoku, vol. 26, March 1963, pp. 81-96, printed in Japanese with English abstract, Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

The Louisiana Shrimp Story, by Percy Viosca, Jr., Wildlife Education Bulletin No. 40, 15 pp., illus., printed, 1962, Louisiana Wildlife and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Describes types of shrimp found in Louisiana waters and their biological characteristics.

Osmoregulation in Two Species of PALAEMONETES (Crustacea: Decapoda) from Florida, by Sheldon Dobkin and Raymond B. Manning, Contribution No. 522, 9 pp., illus., printed, 1964. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 1, March 1964, pp. 149-157.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

"Preservation of shrimp," by Arthur F. Novak, article, ASHRAE Journal, vol. 6, January 1964, p. 76, printed, American Society of Heating, Refrigerating and Air-Conditioning Engineers, 62 Worth St., New York, N. Y.

"Studies on the proteinases of prawn (*Penaeus orientalis* Kishinouye). (1) Division and activities of proteinases contained in the internal organs of prawn," by M. Fujii and others, article, Suisan Daigakko Kenyu Hokoku, vol. 12, no. 1, February 1963, pp. 7-11, printed in Japanese with English abstract, Ministry of Agriculture and Forestry, Marine Products Training Center, Shimonoeki, Japan.

"Studies on the tyrosinase of prawn (*Penaeus orientalis* Kishinouye). (1) Several enzymatic and chemical properties, distribution and activities of tyrosinase, with special reference to determination of the activity by colorimetry of the tyrosine using of a-nitroso-B-

naphthol as indicator," by M. Fujii and others, article, Suisan Daigakko Kenyu Hokoku, vol. 12, no. 1, February 1963, pp. 1-6, printed in Japanese with English abstract, Ministry of Agriculture and Forestry, Marine Products Training Center, Shimonoeki, Japan.

#### SOUTH AFRICA REPUBLIC:

Marine Research at the University of Cape Town, 1959-1962, by J. H. Day, 16 pp., illus., printed, 1963. University of Cape Town, Cape Town, Republic of South Africa. Discusses world-wide interest in marine research, history of marine biological and oceanographic research at the University of Cape Town, objectives of oceanographic investigations, achievements in that field at Cape Town during 1959-62, and needs of the Institute of Oceanography for vessels and equipment.

#### SOUTHEAST ASIA:

Preliminary Bibliography of Fish and Fisheries for Cambodia, Laos and Vietnam, compiled by A. Soulier, Occasional Paper 63/11, 80 pp., printed, 1963. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

#### SPAIN:

Foreign Trade Regulations of Spain, by Arley T. Caudill, OBR 64-51, 8 pp., printed, May 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The report discusses trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries.

Pesca y Conservas (Fishing and Canning), by Gaspar Masso; Itinerarios Turistico-Gastronomicos de la Provincia de Pontevedra (Itineraries of Gastronomic Tours of the Province of Pontevedra), by Alvaro Cunqueiro, Series, Nuestra Futuro Alimenticio (Our Future Food), 52 pp., printed, April 1964, Talleres de Artes Graficas de Faro de Vigo, S. A., Vigo, Spain. Contains graphics given at a festival, "Three Weeks in Pontevedra," celebrated in Madrid in May 1963.

"Pesqueros construidos en la region Levantina" (Fishing boats built on the east coast of Spain), by R. Díez Davó, article, Ingeniería Naval, vol. 30, no. 328, 1962, pp. 361-370, illus., printed in Spanish, Escuela Especial de Ingenieros Navales, Ciudad Universitaria, Apartado de Correos 457, Madrid, Spain.

"Plan de desarrollo economico para la pesca" (Plan of economic development for fisheries), article, Boletín de Informacion, no. 65, February 1964, pp. 3-14, printed in Spanish, Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6.ª planta, Madrid, Spain.

Publicaciones Tecnicas de la Junta de Estudios de Pesca (Technical Publications of the Fishery Research Committee), Publication No. 3, 403 pp., illus., printed in Spanish, 1964. Direccion General de Pesca Maritima, Subsecretaria de la Marina Mercante,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Dirección General de Pesca Marítima, Madrid, Spain. Includes, among others, these articles: "Experiencias sobre 'selectividad' de artes de arrastre en el Golfo de Vizcaya, 20 al 30 de abril de 1963" (Experiments with the 'selectivity' of trawls in the Gulf of Vizcaya, April 20-30, 1963); "Plan experimental de pesca de arrastre en la Provincia de Castellón" (Experimental plan for trawl fishing in the Province of Castellón); and "Movimientos migratorios del atún, *Thunnus thynnus* (L.), deducidos por nuestras propias 'marcaciones' en aguas Españolas" (Migratory movements of the tuna, *Thunnus thynnus* L., deduced from our tags in Spanish waters), by Julio Rodríguez-Roda.

#### SPINY LOBSTER:

"Spiny lobster industry in southern Africa," article, *Nature*, vol. 202, no. 4937, June 13, 1964, p. 1067, printed, single copy 4s. (about 55 U.S. cents.). St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010. Discusses the spiny lobster fishery and export industry in the Republic of South Africa, South-West Africa, Mozambique, and Tristan da Cunha. In 1960, known lobster exports from Africa consisted of 10 million pounds of frozen tails, more than 800,000 pounds of canned meat, and about 2.25 million pounds of fresh or frozen whole lobsters.

"Sponge as shelter for young spiny lobsters," by N. Alam Khandker, article, *Transactions of the American Fisheries Society*, vol. 93, no. 2, 1964, p. 205, printed. American Fisheries Society, 1404 New York Ave., NW., Washington, D. C. 20005.

#### SPRAT:

*Synopsis of Biological Data on Sprat SPRATTUS* (Linnaeus) 1758 (Mediterranean and Adjacent Seas), by M. Demir, FAO Fisheries Synopsis No. 27, 41 pp., illus., processed, February 1963, distribution restricted. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

#### SQUID:

"Biochemical studies on squid, 18--Glycogen in muscle, 19--On the glucosamin content in the pen, 20--On the cloudiness of the extracts obtained from squid muscle," by K. Kitabayashi and others, article, *Suisan-chō Hokkaido-ku Suisan Kenkyūjo Kenkyū Hokoku*, vol. 26, March 1963, pp. 97-110, printed in Japanese with English abstract. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan.

"On the red and yellow discoloration of squid," by Eiichi Tanikawa, article, *Chemical Abstracts*, vol. 56, June 11, 1962, 14676h, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### STARFISH:

"Variations in time and intensity of setting of the starfish, *Asterias forbesi*, in Long Island Sound during a twenty-five-year period," by Victor L. Loosanoff, article, *The Biological Bulletin*, vol. 126, no. 3, February to June 1964, pp. 423-439, illus., printed, single copy \$3.75. Lancaster Press, Inc., Prince and Lemon Sts., Lancaster, Pa.

#### ST. PIERRE AND MIQUELON:

"A propos de la construction d'une nouvelle usine frigorifique à Saint Pierre-et-Miquelon" (The con-

struction of a new freezing plant at St. Pierre and Miquelon), article, *France Pêche*, no. 84, May 1964, pp. 135-137, 139-140, 160, 162, illus., printed in French, single copy 2.50 F. (about 52 U.S. cents.). France Pêche, Boîte Postale 179, Lorient, France.

#### SUBMARINES FOR FISHERY RESEARCH:

"The sea beneath us," article, *Business Week*, no. 1811, May 16, 1964, pp. 48, 50, 52, illus., printed, single copy 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. "Oceanographers come into their own, as Navy and industry look for new worlds to conquer. Some weird-looking vessels will be going down to the bottom this summer," states this article. Discusses the Navy's interest in developing new types of submarines; a new vessel, the *Alvin*, built for the Woods Hole Oceanographic Institution; the *Deepstar*, built to do underwater research for a private corporation; and the *Turtle*, still in the planning stage.

#### TAGGING:

"On the tagging experiments for fisheries research in Japan," by K. Kurogane, article, *Nihon Suisan Gakkai-shi*, vol. 29, no. 5, May 1963, pp. 482-496, printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### TAIWAN:

*Fisheries of Taiwan*, 1963, 33 pp., printed, 1963. Fisheries Bureau, Taipei, Taiwan.

#### TASMANIA:

*Report for the Year Ended June 30th, 1963*, 9 pp., printed, 1963. Inland Fisheries Commission, Hobart, Tasmania.

#### TEXAS:

*Publications of the Institute of Marine Science*, vol. 8, November 1962, 420 pp., illus., printed, single copy \$4.15. Institute of Marine Science, The University of Texas, Port Aransas, Texas. This volume includes, among others, articles on: "Institute of Marine Science, staff and students for 1960/1961;" "Fish production and biomass studies in relation to photosynthesis in the Laguna Madre of Texas," by Thomas R. Hellier, Jr.; "Some aspects of osmotic and ionic regulations in the blue crab, *Callinectes sapidus*, and the ghost crab, *Ocypode albicans*," by Charles A. Gifford; "Osmotic and ionic concentrations in the mantis shrimp, *Squilla empusa* Say," by Byung Don Lee and William N. McFarland; "Phosphorus content of some fishes and shrimp in the Gulf Coast of Mexico," by Kenneth T. Marvin and Larence M. Lansford; "A study of redfish, *Sciaenops ocellata* Linnaeus and black drum, *Pogonias cromis* Linnaeus," by Ernest G. Simmons and Joseph P. Breuer; "Shrimp landings and production of the State of Texas for the period 1956-1959, with a comparison with other Gulf States," by Gordon Gunter; "Marine algae from the Gulf Coast of Texas and Mexico," by H. J. Humm and H. H. Hildebrand; "Fishes of Rio Tamesi and related coastal lagoons in east central Mexico, with notes on their distribution, ecology, and zoogeographic relations," by Reznat M. Darnell; and "Mollusks of Alacran Reef, Campeche Bank, Mexico," by Winnie H. Rice and Louis S. Kornicker.

*Publications of the Institute of Marine Science*, vol. 9, December 1963, 498 pp., illus., printed, single copy

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\$4.15. Institute of Marine Science, The University of Texas, Port Aransas, Texas. This volume includes, among others, these articles: "Institute of Marine Science, staff and students for 1962;" "Helicopter borne purse net for population sampling of shallow marine bays," by Robert S. Jones and others; "Seasonal change in the number and the biomass of fishes from the surf at Mustang Island, Texas," by William N. McFarland; "Oxygen metabolism of four Oklahoma farm ponds," by B. J. Copeland and W. R. Whitworth; and "Experiments with engineering of marine ecosystems," by Howard T. Odum and others.

#### THAILAND:

Preliminary Bibliography of Fish and Fisheries of Thailand (up to End 1961), by A. Soulier, Occasional Paper 63/8, 63 pp., printed, 1963. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

#### TILAPIA:

"The effects of temperature, light and high frequency radio waves upon the embryonic development of *Tilapia macrocephala* (Bleeker)," by Sanford Herbert Vernick, article, *Biological Abstracts*, vol. 42, no. 5, 1963, 18251, printed, *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

#### TRAWLERS:

"Après les essais en pêche du 'Sera': le chalutage arrière est applicable à tous les bateaux quel que soit leur tonnage" (Since the attempts of the 'Sera', stern trawling is possible for all vessels, regardless of their tonnage), article, *France Pêche*, no. 83, April 1964, pp. 31-36, illus., printed in French, single copy 2.50 F. (about 52 U. S. cents), *France Pêche*, Boite Postale 179, Lorient, France.

Development of Equipment for Trawlers, by J. J. Wartner, 7 pp., printed, 1963. (Reprinted from *Engineering*, October 1963.) Torry Research Station, Aberdeen, Scotland.

"Freezing plant in distant water, side trawlers. The conversion of the Icelandic motor trawler Narfi," by M. B. F. Ranken, article, *Modern Refrigeration*, vol. 66, May 1963, pp. 445-448, 452, printed, *Refrigeration Press Ltd.*, MacLaren House, 131 Great Suffolk St., London SE1, England.

#### TROUT:

"Trout hatchery operation below a high dam," by P. G. Barnikol, article, *U. S. Trout News*, vol. 8, no. 6, March-April 1964, pp. 4-5, 16-17, illus., printed, *U. S. Trout Farmers Association*, 110 Social Hall Ave., Salt Lake City 11, Utah.

#### TUNA:

"An examination of fluctuations in the 'concentration index' of purse-seiners and bait boats in the fishery for tropical tunas in the eastern Pacific, 1951-1961," by Thomas P. Calkins, article, *Bulletin of the Inter-American Tropical Tuna Commission*, vol. 8, no. 5, 1963, 59 pp., printed in Spanish and English, *Inter-American Tropical Tuna Commission*, La Jolla, Calif.

"Fecundity of yellowfin tuna (*Thunnus albacares*) and skipjack (*Katsuwonus pelamis*) from the Eastern Pa-

cific Ocean," by James Joseph, article, *Inter-American Tropical Tuna Commission Bulletin*, vol. 7, no. 4, 1963, pp. 1-36, printed, *Inter-American Tropical Tuna Commission*, La Jolla, Calif.

"Phospholipids of tuna white muscle," by C. Yvonne Shuster, J. R. Froines, and H. S. Olcott, article, *Journal of the American Oil Chemists' Society*, vol. 41, January 1964, pp. 36-41, printed, *American Oil Chemists' Society*, 35 E. Wacker Dr., Chicago 1, Ill.

"Predicting green meat of tuna based on the relation between trimethylamine, trimethylamine oxide, and myoglobin of tuna meat," by Tadajiro Nagaoka and Naotatsu Suzuki, article, *Chemical Abstracts*, vol. 59, September 16, 1963, 6905e, printed, *The American Chemical Society*, 1155 16th St. NW., Washington, D. C. 20006.

#### TURKEY:

*Balık ve Balıkçılık* (Fish and Fishery), vol. 12, no. 5, 1964, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balık Kurumu G. M., Balıkçılık Mudurluğu, Besiktas, Istanbul, Turkey. Contains, among others, these articles: "The Sponge (Part IV)," and "Basic researches on the development of fishery in Turkish waters, lakes, and dams (Part IV)."

Foreign Trade Regulations of Turkey, OBR 64-52, 8 pp., printed, May 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The report discusses trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries.

#### ULTRAVIOLET RADIATION:

Ultraviolet Irradiation of Circulating Refrigerated Fish Storage Brines, by J. W. Boyd and B. A. Southcott, Reprint No. 760, 7 pp., illus., printed, (Reprinted from *Journal of the Fisheries Research Board of Canada*, vol. 21, no. 1, 1964, pp. 37-43.) Queen's Printer and Controller of Stationery, Ottawa, Canada. Irradiation of refrigerated brines with ultraviolet radiation was effective in controlling bacterial development in the brine during the post-mortem storage of lingcod (*Ophiodon elongatus*) and sockeye salmon (*Oncorhynchus nerka*). The bacteriological and organoleptic quality of the fish was not improved by continuous or intermittent exposure of brines to ultraviolet radiation. Irradiation of highly contaminated turbid brines resulted in the killing of a large percentage of the initial bacterial population. Intermittent or continuous irradiation of brines produced off-odors in the brine and in the stored fish. Discoloration developed in the irradiated brine and on exposed surfaces of the stored fish.

#### UNITED KINGDOM:

*Fish Stock Record*, 1962, 53 pp., illus., processed, 1963. Department of Agriculture and Fisheries for Scotland, St. Andrew's House, Edinburgh 1, Scotland. Discusses the English and Scottish demersal and

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pelagic fisheries. Presents a number of statistical tables showing fishing effort and cod catches from the North Sea in 1961/62; fishing effort and cod and haddock catches landed by British vessels from Faroes, 1961/62; herring fishery, catch per unit of effort; catch data for the sprat fishery; and other similar data.

Scottish Sea Fisheries Statistical Tables, 1962, 51 pp., printed, 1963, 5s. 6d. (about 76 U.S. cents). Her Majesty's Stationery Office, 13a Castle St., Edinburgh 2; Scotland. Contains 27 statistical tables showing quantity and value of fish landed and processed, number of vessels and fishermen, and creek returns.

#### UNITED STATES FISHING INDUSTRY:

"An antiquated and fragmented U. S. fishing industry faces many problems," by Harlan C. Lampe, article, *Maritimes*, vol. 8, no. 2, Spring 1964, pp. 1-3, illus., printed. Graduate School of Oceanography, University of Rhode Island; Kingston, R.I. "Few countries in the world other than us can afford the luxury of a declining fishing industry. . . . In sum, the fishing industry is a collection of people and firms, buying, selling and producing fish. The interest of the groups in this collection are not common, and important economic forces tend to tear the industry into its component parts. Only in the area of market development and quality improvement does one find reasonable common cause. However, without cooperative effort among all groups in the industry, even this will only slowly be achieved," states the author.

#### U.S.S.R.

*Soviet Fisheries Investigations in the Northwest Atlantic*, edited by Yu. Yu. Marti, OTS 63-11102, 377 pp., illus., processed, 1963, \$3.75. (Translated from the Russian, *Sovetskii Rybokhozyaistvennyye Issledovaniya v Severo-Zapadnoi Chasti Atlanticheskogo Okeana*.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### VIET-NAM:

*Marine Fisheries Statistics of Vietnam, 1962*, compiled by Z. Tokagi and K. Torikai, 51 pp., illus., printed in Vietnamese and English. Division of Agriculture & Natural Resources, United States Operations Mission to Vietnam, U.S. Embassy, Saigon, Vietnam. This booklet presents tables on fisheries of that country's 20 coastal provinces, based on data for 1960 plus results of subsequent on-the-spot surveys. Included are tables and graphs on number of fishermen's households and population by province; fishing boats by year, tonnage, and province; fish catch by year, province, and fishing method; and other topics. Photos and maps add interest to this report.

#### WALLEYED PIKE:

"The movements of walleyes tagged as yearlings in Lake Erie," by David R. Wolfert, article, *Transactions of the American Fisheries Society*, vol. 92, no. 4, 1963, pp. 414-420, printed. American Fisheries Society, 1404 New York Ave., NW. Washington, D.C. 20005.

#### WASHINGTON:

*Fisheries Research Papers*, vol. 2, no. 3, March 1964, 102 pp., illus., printed. Washington Department of

Fisheries, Rm. 115, General Administration Bldg., Olympia, Wash. Contains these articles: "The distribution, size, time and current preferences of seaward migrant chinook salmon in the Columbia and Snake Rivers," by Edward M. Mains and John M. Smith; "The relationship of age to length in Puget Sound resident chinook salmon," by J. E. Lasater and Frank Haw; "Maturation, gestation, and birth of rockfish (Sebastes) from Washington and adjacent waters," by Allan C. Delacy, Charles R. Hitz, and Robert L. Dryfoos; "Notable migrations of sablefish tagged in Puget Sound," by Nicholas Pasquale; and "Growth and ring formation of Washington razor clams," by Herb C. Tegelberg.

*Washington State Shellfish*, 15 pp., illus., printed, April 1964. Washington State Department of Fisheries, Rm. 115, General Administration Bldg., Olympia, Wash. Contains sections describing oysters, Pacific razor clams, hardshell clams, shrimp, Dungeness crabs, public beaches in Washington, and digging techniques for obtaining shellfish. Also included is a statement of regulations governing the digging of shellfish in the State.

#### WATER RESOURCES:

*Is the Sea Inexhaustible?*, by Percy Viosca, Jr., 7 pp., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130.

#### WEST AFRICA:

*Problemes et perspectives de l'organisation des economies de peche maritime dans les etats de l'Afrique occidentale en 1962* (Problems and Observations of the Economic Organization of Marine Fisheries in West African Countries, 1962), by F. Doumenge, 66 pp., illus., printed in French, 1963. (Reprinted from *Bulletin de la Section de Géographie*, vol. 75, 1962, pp. 219-284.) Section de Géographie, Comité des Travaux Historiques et Scientifiques, Ministère de l'Éducation Nationale, Paris, France.

#### WHALE-MEAT MEAL:

"Whale meat meal," by G. Ahman, article, *Vara Palsdjur*, vol. 33, 1962, pp. 97-98, printed in Swedish. Sveriges Palsdjur Suppfodares Rikssörbund, Porsgaten 4, Stockholm, Sweden.

#### WHALES:

"A Review of Japanese whale marking in the North Pacific to the end of 1962, with some information on marking in the Antarctic," by Hideo Omura and Seiji Ohsumi, article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 53, no. 4, April 1964, pp. 90, 92-112, illus., printed. Hvalfangerforeningen, Sandefjord, Norway. Reviews Japanese whale marking in the North Pacific since 1949, and in the Antarctic during the 1955/56-1961/62 seasons. Includes several statistical tables showing number of whales marked, recovery of marks, and recapture of whales.

#### WORLD PRODUCTION:

"Marine fish production: A world-wide view," by C. P. Idyll, article, *Proceedings of the International Congress of Zoology*, vol. 16, no. 4, 1963, pp. 330-335, printed. Secretary, Permanent Committee of International Zoological Congresses, 105 Blvd. Raspail, Paris 6, France.







## SAVORY SALMON SALAD

Canned salmon makes balancing the budget bearable and feeding the family fun during summer months. For the busy homemaker, U.S. Bureau of Commercial Fisheries Test Kitchen economists have developed several serving tips with an easy-to-do Savory Salmon Salad. Generous portions of this salmon salad heaped on crusty hard rolls or buns will fill the bill with eager eaters. Crisp garden-fresh vegetables also add eye appeal.

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### Savory Salmon Salad

- 1 can (1 pound) salmon
- 1 cup chopped celery
- 2 hard-cooked eggs, chopped
- $\frac{1}{2}$  cup mayonnaise or salad dressing
- 2 tablespoons chopped onion
- 2 tablespoons chopped sweet pickle or drained pickle relish


### Lettuce

Drain and flake salmon. Combine all ingredients except lettuce. Serve on lettuce. Serves 6.




Right foreground, Salmon Pineapple Dip; center, Savory Salmon Salad on rolls or buns; left background, tomatoes topped with Savory Salmon Salad; upper left background, Salmon a La King.

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# COMMERCIAL FISHERIES REVIEW



VOL. 26, NO. 10

OCTOBER 1964

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
*Fish and Wildlife Service*  
**Bureau of Commercial Fisheries**  
*Washington, D.C.*





# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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5/31/68

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## FISH SWIMMING SPEEDS

Two University of California (at Los Angeles) scientists, using a magnetic "speedometer" attached to a fishing rod, measured the speed of a yellowfin tuna at about 45 miles per hour. A wahoo, a mackerel-like fish, swam up to 48 miles per hour. Zoologists previously have been of the opinion that fish seldom ever swam faster than 27 m.p.h. (Pacific Marine Fisheries Commission Newsletter, July 1, 1964.)



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\* \* \* \* \*

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## COMPARISON OF SALMON CATCHES IN MONOFILAMENT AND MULTIFILAMENT GILL NETS--Part II

By Herbert A. Larkins\*

### ABSTRACT

The second phase of a monofilament-multifilament gill-net study was completed by the U. S. Bureau of Commercial Fisheries during the 1963 summer field season. Salmon catches in standard multifilament nets were compared with those in an all-monofilament net unit. Results of a 1962 study, in which multifilament nets were compared with alternate monofilament-multifilament nets, are also examined in an analysis of efficiency and cost of three gill-net combinations.

Sockeye catches in all-monofilament nets were greater than in all-multifilament, but chum and pink catches were the same in both gear types, as were the lengths of all species. In terms of cost and efficiency, the alternated combination appeared superior for the capture of high-seas salmon followed by all-multifilament and all-monofilament.

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### INTRODUCTION

In the salmon research program in the North Pacific Ocean and Bering Sea by the U. S. Bureau of Commercial Fisheries, one facet of the work has been an investigation into more efficient sampling gear. Much of the Bureau's research, in support of the United States Section of the International North Pacific Fisheries Commission, has required relatively large numbers of salmon specimens for racial analysis and relative abundance and distribution studies.

The capture of pelagic salmon on the high seas has been accomplished with surface gill nets. To provide adequate samples of each species and age group, the length of the net string has gradually been increased to over  $1\frac{1}{2}$  miles. Increasing the length of the string has resulted in an increase in manpower as well as gear damage and loss from sudden changes in weather, whales, and shipping. In addition, inshore fishing stations in the Aleutian Island chain, an area of considerable interest, are difficult to sample with a long gill-net string because of its susceptibility to tangling in the severe tidal currents near the islands.

The apparent success reported by the Japanese high-seas commercial salmon fishery with monofilament gill nets stimulated Bureau scientists to investigate the relative efficiency of monofilament netting and its potential as a research-sampling tool.

In the first phase of the study, conducted during the 1962 summer field season (reported in the May 1963 *Commercial Fisheries Review*), the catches in standard multifilament nets were compared with those in the monofilament nets of an experimental unit of alternate mono-

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filament-multifilament nets of like mesh size and construction. The results of that phase indicated a significantly larger catch in the monofilament nets and, in general, provided samples directly comparable to those of the multifilament nets in terms of age and length of the fish (Larkins 1963).



Fig. 1 - The Bureau of Commercial Fisheries research vessel *George B. Kelez*.

The results of the second phase of the study, in which the standard multifilament nets were tested against an experimental unit of all-monofilament nets, are reported here. This experiment, completed during the 1963 summer cruise of the Bureau's research vessel *George B. Kelez* (fig. 1), was also designed to permit a three-way comparison between all-multifilament, alternate multifilament-monofilament, and all-monofilament net combinations.

### METHODS AND MATERIALS

The multifilament nets, each 50 fathoms long and 4 fathoms deep, were made of type 330 nylon. The mesh sizes used were the same as in past years:  $5\frac{1}{2}$ ,  $4\frac{1}{2}$ ,  $3\frac{1}{2}$ , and  $2\frac{1}{2}$  inches (stretched measure). The webbing, dyed dark green, was "hung in" 50 percent on the cork and lead lines.

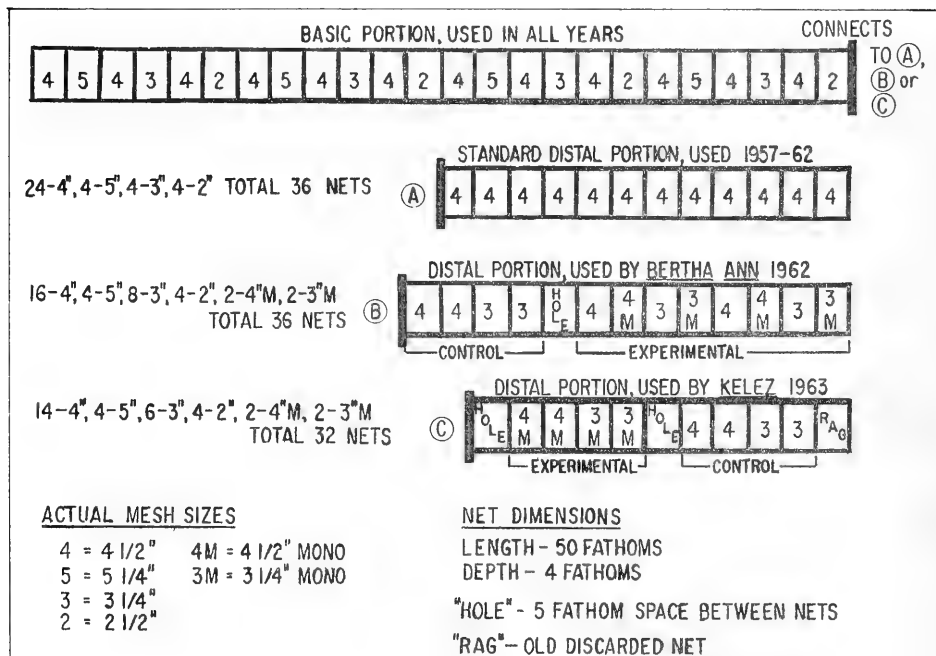


Fig. 2 - Composition of high-seas salmon gill nets used by the Bureau of Commercial Fisheries from 1957 through 1963.

Table 1 - Comparison of Gross Catches in Monofilament and Multifilament Gill Nets, 1963

Table 1 - Comparison of Gross Catches in Monofilament and Multifilament Gill Nets, 1963																				
Set Number	Date	3 1/2-Inch Multifilament							3 1/2-Inch Monofilament											
		No. of Sock-eye	No. of Chum	Total No.	No. of Nets	Catch Per Net (Number)	Catch Per Net (No.)	Total Catch Per Net (No.)	No. of Sock-eye	No. of Chum	Total No.	No. of Nets	Catch Per Net (Number)	Catch Per Net (No.)	Total Catch Per Net (No.)					
1	7/3	5	2	1	8	6	0.8	0.3	0.2	1.3	1	1	0	2	2	0.5	0.5	0	1.0	
2	7/4	5	4	0	9	6	0.8	0.7	0	1.5	2	5	0	7	2	1.0	2.5	0	3.5	
3	7/5	0	0	0	0	6	0	0	0	0	0	0	0	2	0	0	0	0	0	
4	7/7	6	10	0	16	6	1.0	1.7	0	2.7	15	0	0	15	2	7.5	0	0	7.5	
5	7/8	8	5	0	13	6	1.3	0.8	0	2.2	2	2	0	4	2	1.0	1.0	0	2.0	
6	7/9	11	19	0	30	6	1.8	3.2	0	5.0	4	10	1	15	2	2.0	5.0	0.5	7.5	
7	7/10	5	5	0	10	6	0.8	0.8	0	1.7	0	0	0	2	0	0	0	0	0	
8	7/11	14	0	1	15	6	2.3	0	0.2	2.5	1	0	0	1	2	0.5	0	0	0.5	
9	7/15	6	5	0	11	6	1.0	0.8	0	1.8	1	1	0	2	2	0.5	0.5	0	1.0	
10	7/17	45	7	0	52	6	7.5	1.2	0	8.7	16	2	0	18	2	8.0	1.0	0	9.0	
11	7/18	80	5	0	85	6	13.3	0.8	0	14.2	36	1	0	37	2	18.0	0.5	0	18.5	
12	7/19	21	1	0	22	6	3.5	0.2	0	3.7	8	0	0	8	2	4.0	0	0	4.0	
13	7/20	94	9	0	103	6	15.7	1.5	0	17.2	41	1	0	42	2	20.5	0.5	0	21.0	
14	7/23	109	3	1	113	6	18.2	0.5	0.2	18.8	65	0	0	65	2	32.5	0	0	32.5	
15	7/26	426	6	0	432	6	71.0	1.0	0	72.0	235	2	0	237	2	117.5	1.0	0	118.5	
16	7/29	No monofilament				50	6	8.0	0.3	0	8.3	27	3	1	31	2	13.5	1.5	0.5	15.5
17	7/30	48	2	0	46	6	6.8	0.8	0	7.7	34	1	0	35	2	17.0	0.5	0	17.5	
18	7/31	4	5	0	9	6	0.7	0.8	0	1.5	0	3	0	3	2	1.5	0	0	1.5	
19	8/2	89	4	0	93	6	14.8	0.7	0	15.5	37	3	0	40	2	18.5	1.5	0	20.0	
20	8/4	85	2	0	87	6	14.2	0.3	0	14.5	100	3	0	103	2	50.0	1.5	0	51.5	
21	8/5	No monofilament																		
22	8/11	No monofilament																		
23	8/12	39	4	0	43	6	6.5	0.7	0	7.2	12	6	0	18	2	6.0	3.0	0	9.0	
24	8/13	35	10	0	45	6	5.8	1.7	0	7.5	11	3	0	14	2	5.5	1.5	0	7.0	
25	8/14	11	1	0	14	6	1.8	0.5	0	2.3	2	4	0	6	2	1.0	2.0	0	3.0	
26	8/15	Net string rolled																		
27	8/18	No monofilament																		
28	8/19	No monofilament																		
29	8/20	No monofilament																		
30	8/22	No monofilament																		
31	8/23	No monofilament																		
32	8/24	No monofilament																		
33	8/27	22	10	0	32	6	3.7	1.7	0	5.3	8	4	0	12	2	4.0	2.0	0	6.0	
34	8/28	41	22	0	63	6	6.8	3.7	0	10.5	10	4	0	14	2	5.0	2.0	0	7.0	
35	8/29	26	81	1	108	6	4.3	13.5	0.2	18.0	18	17	0	35	2	9.0	8.5	0	17.5	
36	8/30	19	17	0	36	6	3.2	2.8	0	6.0	10	6	16	2	5.0	3.0	0	8.0		
37	8/31	23	0	0	32	6	3.8	1.5	0	5.3	11	1	0	12	2	5.5	0.5	0	6.0	
38	9/1	Net string rolled																		
39	9/2	19	1	0	20	6	3.2	0.2	0	3.3	9	2	0	11	2	4.5	1.0	0	5.5	
40	9/4	16	0	0	16	6	2.7	0	0	2.7	16	0	0	16	2	8.0	0	0	8.0	
41	9/9	No monofilament																		
42	9/11	No monofilament																		
Total . . . .		1,353	256	4	1,613	180	7.5	1.4	-	8.96	732	85	2	819	60	12.2	1.4	-	13.65	

Set Number	Date	4 1/2-Inch Multifilament							4 1/2-Inch Monofilament											
		No. of Sock-eye	No. of Chum	Total No.	No. of Nets	Catch Per Net (Number)	Catch Per Net (No.)	Total Catch Per Net (No.)	No. of Sock-eye	No. of Chum	Total No.	No. of Nets	Catch Per Net (Number)	Catch Per Net (No.)	Total Catch Per Net (No.)					
1	7/3	4	1	5	10	14	0.3	0.1	0.4	0.7	2	2	4	8	2	1.0	1.0	2.0	4.0	
2	7/4	18	8	4	30	14	1.3	0.6	0.3	2.1	2	2	1	5	2	1.0	1.0	0.5	2.5	
3	7/5	0	0	0	0	14	0	0	0	0	0	0	0	2	0	0	0	0	0	
4	7/7	10	1	2	13	14	0.7	0.1	0.1	0.9	5	0	0	5	2	2.5	0	0	2.5	
5	7/8	26	4	9	39	14	1.9	0.3	0.6	2.8	9	3	3	15	2	4.5	1.5	1.5	7.5	
6	7/9	24	15	86	125	14	1.7	1.1	6.1	8.9	7	4	21	32	3.5	2.0	0.5	16.0		
7	7/10	3	8	7	18	14	0.2	0.6	0.5	1.3	0	1	1	2	2	0.5	0.5	1.0	0	
8	7/11	20	2	6	28	14	1.4	0.1	0.4	2.0	4	1	3	8	2	2.0	0.5	1.5	4.0	
9	7/15	1	8	1	10	14	0.1	0.6	0.1	0.7	1	3	1	5	2	0.5	1.5	0.5	2.5	
10	7/17	69	19	7	95	14	4.9	1.4	0.5	6.8	17	2	2	21	2	8.5	1.0	1.0	10.3	
11	7/18	163	22	5	190	14	11.6	1.6	0.4	13.6	41	4	0	45	2	20.5	2.0	0	22.5	
12	7/19	8	14	0	22	14	0.6	1.0	0	1.6	3	3	0	6	2	1.5	1.5	0	3.0	
13	7/20	64	16	1	81	14	4.6	1.1	0.1	5.8	9	2	0	11	2	4.5	1.0	0	5.5	
14	7/23	42	2	1	45	14	3.0	0.1	0.1	3.2	20	3	0	23	2	10.0	1.5	0	11.5	
15	7/26	213	27	4	244	14	15.2	1.9	0.6	17.4	37	3	2	42	2	18.5	1.5	1.0	21.0	
16	7/29	No monofilament																		
17	7/30	94	33	6	133	14	6.7	2.4	0.4	9.5	9	2	0	11	2	4.5	1.0	0	5.5	
18	7/31	89	40	2	131	14	6.4	2.9	0.1	9.4	16	5	0	21	2	8.0	2.5	0	10.5	
19	8/2	17	84	0	101	14	1.2	6.0	0	7.2	2	5	0	7	2	1.0	2.5	0	3.5	
20	8/3	95	20	0	115	14	6.8	1.4	0	8.2	20	5	0	25	2	10.0	2.5	0	12.5	
21	8/4	81	87	0	147	14	5.8	4.8	0	10.5	40	4	0	44	2	20.0	2.0	0	22.0	
22	8/5	No monofilament																		
23	8/11	No monofilament																		
24	8/12	48	23	0	71	14	3.4	1.6	0	5.1	6	3	0	9	2	3.0	1.5	0	4.5	
25	8/13	48	40	0	88	14	3.4	2.9	0	6.3	6	3	0	9	2	3.0	1.5	0	4.5	
26	8/14	11	52	0	63	14	0.8	3.7	0	4.5	5	8	0	13	2	2.5	4.0	0	6.5	
27	8/15	Net string rolled																		
28	8/18	No monofilament																		
29	8/19	No monofilament																		
30	8/20	No monofilament																		
31	8/22	No monofilament																		
32	8/23	No monofilament																		
33	8/24	No monofilament																		
34	8/27	11	38	0	49	14	0.8	2.7	0	3.5	0	4	0	4	2	0	2.0	0	2.0	
35	8/28	31	72	2	105	14	2.2	5.1	0.1	7.5	6	7	0	13	2	3.0	3.5	0	6.5	
36	8/29	15	64	0	79	14	1.1	4.6	0	5.6	2	3	0	5	2	1.0	3.0	0	2.5	
37	8/30	4	54	0	58	14	0.3	3.9	0	4.2	1	0	8	0	2	0	4.0	0	4.0	
38	8/31	31	2	0	73	14	2.2	3.0	0	5.1	7	7	0	8	2	0.5	3.5	0	4.0	
39	9/1	Net string rolled																		
40	9/2	16	17	0	33	14	1.1	1.2	0	2.4	1	2	0	3	2	0.5	1.0	0	1.5	
41	9/4	77	6	0	83	14	5.5	0.4	0	5.9	6	3	0	9	2	3.0	1.5	0	4.5	
42	9/9	No monofilament																		
43	9/11	No monofilament																		
Total . . . .		1,333	1799	148	2,280	420	3.17	1.90	0.35	5.43	277	102	38	417	60	4.62	1.70	0.63	6.95	

The experimental monofilament nets, dyed light grey, were constructed identically with the multifilament nets; only the  $4\frac{1}{2}$ - and  $3\frac{1}{4}$ -inch mesh sizes were used. The webbing, of Japanese manufacture, was very similar to the German Perlon used in 1962.

The vessel's net string (fig. 2) was composed of a standard 24 net portion of all-multifilament webbing with varying mesh sizes, an experimental portion consisting of two  $3\frac{1}{4}$ - and two  $4\frac{1}{2}$ -inch monofilament nets, and a control portion of two  $3\frac{1}{4}$ - and two  $4\frac{1}{2}$ -inch multifilament nets. All nets within each portion were laced together to form a continuous unit and a five-fathom opening was left between each portion so fish could not lead from one unit to another. An old, discarded net "rag" was attached to the end of the string to prevent bunching of the last net.

The 32 net string, equipped with two lighted flag poles and radio buoys, was set shortly after dark, allowed to drift freely through the night, and hauled after dawn. Setting took about 45 minutes, the nets fished for an average of 12 hours, and hauling time varied from  $1\frac{1}{2}$  to 3 hours.

The nets were repaired daily and replaced when necessary. Through the season, as the nets became worn, their efficiency was probably somewhat reduced, but the state of repair of the two types of webbing is believed to have been equal at any one time.

Both the basic and control portions of the net strings in 1962 and 1963 were identical, except for the position of the control portion, and from the basis for comparison between the alternated monofilament-multifilament unit in 1962 and the all-monofilament unit in 1963.

## RESULTS

The 1963 salmon catches by net type for the  $3\frac{1}{4}$ - and  $4\frac{1}{2}$ -inch nets are shown in table 1. Preliminary tests between the total salmon catch per net of the multifilament nets in the basic and control portions of the string over the entire season show no significant differences<sup>1</sup>. Therefore, all of the  $3\frac{1}{4}$ - and  $4\frac{1}{2}$ -inch multifilament nets have been used in the comparison with monofilament catches.

In 73 percent of the  $3\frac{1}{4}$ -inch and 57 percent of the  $4\frac{1}{2}$ -inch comparisons, the total catch per unit of effort of the monofilament exceeded that of the multifilament nets; over the season, the  $3\frac{1}{4}$ -inch monofilament caught 1.5 and the  $4\frac{1}{2}$ -inch monofilament 1.3 times as many salmon per net as the multifilament.

In the comparison of individual species taken in the two net types, a very interesting difference is apparent. While the relative efficiency of the monofilament nets (table 2) for sockeye and pink salmon was considerably higher than that of the multifilament, the catch per net of chum salmon in the two net types was almost identical. Statistically, only the difference in catch of sockeye salmon between the two net types was significant<sup>2</sup>. This difference in relative efficiency of monofilament netting for three species indicates that the species composition of catches in the monofilament and multifilament nets was also different.

Table 2 - Catch Per Unit of Effort for All  $3\frac{1}{4}$ - and  $4\frac{1}{2}$ -Inch Nets and Relative Efficiency of Monofilament, 1963

Mesh Size	Catch Per Net (Number)								Relative Efficiency of Monofilament (Number)			
	Multifilament				Monofilament							
	Sockeye	Chum	Pink	Total	Sockeye	Chum	Pink	Total	Sockeye	Chum	Pink	Total
Inches												
$3\frac{1}{4}$	7.5	1.4	-	8.96	12.2	1.4	-	13.65	1.6	1.0	-	1.52
$4\frac{1}{2}$	3.2	1.9	0.4	5.43	4.6	1.7	0.6	6.95	1.4	0.9	1.8	1.28

<sup>1</sup>/Paired "t" tests:  $3\frac{1}{4}$ -inch mesh nets:  $t = 1.04$  with 29 d.f.

$4\frac{1}{2}$ -inch mesh nets:  $t = 0.48$  with 29 d.f.

<sup>2</sup>/Paired "t" tests:  $3\frac{1}{4}$ -inch mesh nets: sockeye,  $t = -2.3$  with 29 d.f.; chum,  $t = -0.02$  with 29 d.f.

$4\frac{1}{2}$ -inch mesh nets: sockeye,  $t = -2.1$  with 28 d.f.; chum,  $t = 0.8$  with 28 d.f.; pink,  $t = -1.6$  with 14 d.f.

The relationship between the individual sockeye catches in the two net types was linear<sup>3/</sup>, at least over the range of abundance encountered in 1963.

Length frequency curves of sockeye and chum salmon taken in the two net types are similar (fig. 3) and their mean lengths (table 3) are not significantly different<sup>4/</sup>, indicating that the monofilament and multifilament gill nets had the same intraspecies selection properties. These results also infer that, length being a function of ocean-age (Larkins 1963), both net types captured similar proportions of the available ocean-age groups.

Table 3 - Mean Lengths of Salmon Captured in Monofilament and Multifilament Gill Nets, 1963

Species	MESH SIZE Inches	Monofilament ..... (Centimeters) .....	Multifilament
Sockeye	$3\frac{1}{4}$	38.26	37.59
	N=	733	2,155
	$4\frac{1}{2}$	50.30	49.40
	N=	269	1,531
Chum	$3\frac{1}{4}$	40.09	39.43
	N=	86	591
	$4\frac{1}{2}$	51.85	50.90
	N=	101	1,275

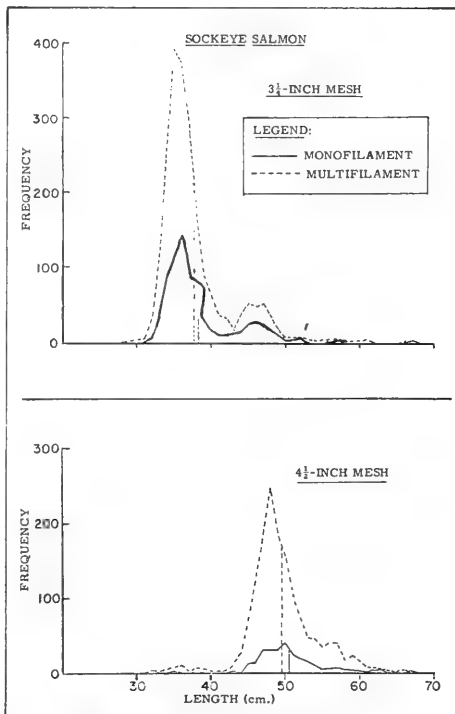
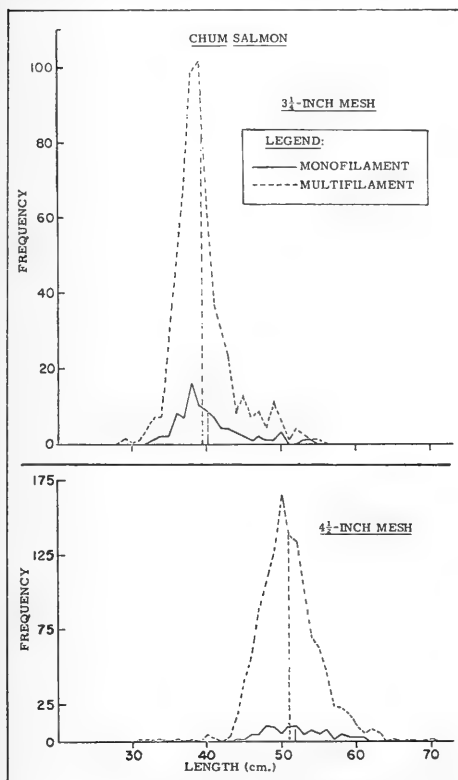


Fig. 3 - Comparison of salmon length-frequencies from monofilament and multifilament gill nets.

$3\frac{1}{4}$ -inch mesh nets:  $r = 0.97$ ; test for  $b = 0$ ,  $t = 19.25$  with 27 d.f.

$4\frac{1}{2}$ -inch mesh nets:  $r = 0.86$ ; test for  $b = 0$ ,  $t = 58.52$  with 27 d.f.

$4/$ Sockeye:  $3\frac{1}{4}$ -inch mesh nets:  $F = < 1.0$  with 1, 2,886 d.f.

$4\frac{1}{2}$ -inch mesh nets:  $F = < 1.0$  with 1, 1,798 d.f.

Chum:  $3\frac{1}{4}$ -inch mesh nets:  $F = < 1.0$  with 1, 875 d.f.

$4\frac{1}{2}$ -inch mesh nets:  $F = < 1.0$  with 1, 1,374 d.f.

## DISCUSSION

To summarize the preceding section, it was shown that the sockeye catches in an all-monofilament gill-net section were significantly greater than in an all-multifilament string, although the catches of chum and pink salmon were, apparently, the same in both net types. The length and age compositions of monofilament catches were the same as those of multifilament catches.

Results of the 1962 study (Larkins 1963), in which alternate monofilament-multifilament nets were used, also showed no difference in age and length comparisons between the net types; however, the catches of all three species were considerably larger in the monofilament nets than in the multifilament. It was also shown that the salmon catches in the multifilament nets adjacent to the monofilament were significantly lower than in the other multifilament nets of the net string; however, additional analysis has indicated that the total catch per unit of alternate monofilament-multifilament nets was still much greater than in an equal section of all-multifilament netting (table 4).

Table 4 - Salmon Catch Per Net in Alternate Monofilament-Multifilament and All-Multifilament Gill Nets, 1962						
Mesh Size	Species	Catch Per Net (Number)				Relative Efficiency of Alternate Unit
		Alternate Unit			All-Multifilament	
		Monofilament	Multifilament	Average of Alternate Unit		
<u>Inches</u>						
3 $\frac{1}{4}$	Sockeye	19.41	4.72	12.07	6.44	1.87
	Chum	5.22	1.28	3.25	1.21	2.69
	Pink	0.12	0.06	0.09	0.05	1.80
	Total	24.76	6.06	15.41	7.70	2.00
4 $\frac{1}{2}$	Sockeye	10.45	3.62	7.04	4.60	1.53
	Chum	3.22	1.36	2.29	1.36	1.68
	Pink	1.92	1.02	1.47	0.74	1.99
	Total	15.59	6.00	10.80	6.70	1.61

In the two phases of the experiment, three combinations of the two gear types were tried; all-multifilament in 1962 and 1963, alternated monofilament in 1962, and all-monofilament in 1963. By relating the catch per unit of effort of the two experimental types to that of the all-multifilament portion for each year, all three types of gear may be ranked by their relative efficiency. This proportional comparison is independent of changes in salmon abundance within or between years.

Table 5 - Relative Efficiency and Relative Cost of Multifilament, Monofilament, and Alternate Multifilament-Monofilament Gill Nets								
	Symbol	Species	Multifilament		Alternate Nets		Monofilament	
			$3\frac{1}{4}$ "	$4\frac{1}{2}$ "	$3\frac{1}{4}$ "	$4\frac{1}{2}$ "	$3\frac{1}{4}$ "	$4\frac{1}{2}$ "
(a) Relative efficiency . . . . .	w	Sockeye	1.0	1.0	1.9	1.5	1.6	1.5
		Chum	1.0	1.0	2.7	1.7	1.0	0.9
		Pink	1.0	1.8	1.8	2.0	-	1.8
		Total	1.0	1.0	2.0	1.6	1.5	1.3
(b) Relative cost <sup>1/</sup> . . . . .	x		1.0	1.0	1.3	1.3	1.6	1.6
(c) Relative life <sup>2/</sup> . . . . .	y		1.0	1.0	0.75	0.75	0.5	0.5
(d) Relative cost/year (x/y) . . . . .	z		1.0	1.0	1.8	1.8	3.2	3.2
(e) Relative cost year/fish		Sockeye	1.0	1.0	0.9	1.2	2.0	2.1
(2/w) . . . . .		Chum	1.0	1.0	0.7	1.1	3.2	3.6
		Pink	1.0	1.0	1.0	0.9	-	1.8
		Total	1.0	1.0	0.9	1.1	2.1	2.5
(f) Relative length of string necessary to catch N fish		Sockeye	1.0	1.0	0.5	0.7	0.6	0.7
(1/w) . . . . .		Chum	1.0	1.0	0.4	0.6	1.0	1.1
		Pink	1.0	1.0	0.6	0.5	-	0.6
		Total	1.0	1.0	0.5	0.6	0.7	0.8

<sup>1/</sup>Based on 55 percent higher initial cost for monofilament.

<sup>2/</sup>Based on 50 percent shorter life for monofilament.

Table 5 (a) portrays the relative efficiency of the three gear units and it is apparent that, regardless of species or mesh size, the alternate monofilament-multifilament string had the highest catch per unit of effort, the all-monofilament moderate, and the all-multifilament the lowest.

Our limited experience with monofilament netting has shown that the initial cost of a finished net is about 55 percent greater than multifilament and, because of the difficulty in repairing monofilament webbing, its life is approximately 50 percent that of multifilament. By combining those factors (table 5 (b), (c)) with the relative efficiency of the three net types, an index of the cost per year per fish has been determined (table 5 (e)). The reciprocal of the relative efficiency (table 5 (f)) is a measure of the relative amount of gear necessary to capture an equivalent number of fish in the three types of gill-net strings.

A comparison of the relative cost per year per fish with the length of a net string necessary to catch equivalent numbers of fish (table 5(e), (f)), allows a final determination of efficiency versus cost. Alternate multifilament-monofilament nets provided the same number of salmon as all-multifilament with about one-half ( $3\frac{1}{4}$ -inch mesh 0.5,  $4\frac{1}{2}$ -inch mesh 0.6) of the effort and at almost the same relative cost per fish ( $3\frac{1}{4}$ -inch mesh 0.9,  $4\frac{1}{2}$ -inch mesh 1.1). Although the all-monofilament gear caught equal numbers of fish with only about three quarters ( $3\frac{1}{4}$ -inch mesh 0.7,  $4\frac{1}{2}$ -inch mesh 0.8) of the amount of gear, the relative cost per sample was over twice that of all-multifilament nets ( $3\frac{1}{4}$ -inch mesh 2.1,  $4\frac{1}{2}$ -inch mesh 2.5).

### CONCLUSIONS

Based on the results of both the 1962 and 1963 phases of this study, the use of monofilament gill nets, either alone or alternated with multifilament nets, provided salmon samples of identical length and age composition as multifilament nets of the same mesh size; however, different proportions of sockeye, chum and pink salmon were taken in the two net types.

Monofilament nets captured more salmon than multifilament, especially when used as alternate monofilament-multifilament gear (alternated with multifilament nets). The relative efficiency of the three gear types tested was highest for alternate monofilament-multifilament, moderate for all-monofilament, and lowest for all-multifilament. Because of the higher initial cost and shorter life of the monofilament webbing, the cost per fish was highest for all-monofilament, moderate for all-multifilament, and lowest for alternate monofilament-multifilament. Therefore, in terms of cost and numbers of salmon captured, the alternate combination appears to have been the superior of the three tested for high-seas salmon fishing.

### LITERATURE CITED

LARKINS, HERBERT A.

1963. Comparison of Salmon Catches in Monofilament and Multifilament Gill Nets. Commercial Fisheries Review, vol. 25, no. 5 (May), pp. 1-11. (Sep. No. 675.)



### CORRECTION

In the August 1964 issue, page 7, the heading should have read: "CHANGES in Abundance of the Marine Worm, GLYCERA DIBRANCHIATA, Associated with Seawater Temperature Fluctuations."

## WEIGHTS AND MEASURES ACTIVITIES IN THE USDI FISHERY PRODUCTS STANDARDS AND INSPECTION PROGRAMS

By J. R. Brooker\*

### BACKGROUND

The complexities of today's processing and distribution of food demand that there become acceptable document between buyer and seller to facilitate orderly marketing. Standards are a yardstick to measure the quality of a product. They thus constitute the needed common measuring device upon which buyer and seller can base their contracts.

Those standards are composed of two or more levels of product quality designated by grades, and are also composed of other related factors--such as class, style, or condition--that may affect the economical use and the desirability of the product. Accordingly, national quality standards tend to improve the overall quality and uniformity of the products being standardized. The consumer thus gains by getting better quality, and the industry in turn gains by creating greater demand for its products.

United States Standards for Grades of Quality for Fish and Fishery Products help to define the level of quality for those food products. The standards are voluntary and reflect the desire of the fishing industry to improve its product quality. The Bureau of Commercial Fisheries of the U. S. Department of the Interior (USDI) has developed and promulgated U. S. Standards for Grades for 14 fishery products in the past 6 years. Those standards were developed with the aid of the fishing industry.

U. S. Standards for Grades of Fishery Products Developed and Promulgated by the U. S. Bureau of Commercial Fisheries	
1. Frozen fried fish sticks	8. Raw headless shrimp
2. Raw breaded shrimp	9. Raw breaded fish portions
3. Fish blocks	10. Ocean perch fillets
4. Haddock fillets	11. Fried scallops
5. Halibut steaks	12. Fried fish portions
6. Cod fillets	13. Breaded fish sticks
7. Salmon steaks	14. Flounder and sole fillets

The standards, of course, would have no value as acceptable documents between buyer and seller unless the grading of the products according to the standards were done by a neutral party. Since 1958 the Bureau of Commercial Fisheries has therefore operated a Voluntary Inspection Service for fishery products. This service has grown steadily. In 1963, for example, over 215 million pounds of fishery products were inspected and certified. That quantity of inspected products represents about one-third of all the domestically processed fishery products for human consumption, exclusive of canned fish.

Proper labeling of packaged fishery products not only is required by law but also is essential in marketing them. As part of the inspection program, the USDI accordingly reviews labels for fishery products that are to bear the USDI shield.

To show the role of weights and measures activities in the USDI Fishery Products Standards and Voluntary Inspection programs, the following three main subjects must be considered:

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Note: A paper presented at the 49th National Conference on Weights and Measures, Washington, D. C. June 17, 1964.

U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Sep. No. 711



1. Relation of weights and measures to the development of the Quality Standards.
2. Relation of weights and measures to the Voluntary Inspection Service.
3. Relation of weights and measures to label approval.

#### RELATION OF WEIGHTS AND MEASURES TO QUALITY STANDARDS DEVELOPMENT

The Bureau's program of standards development goes beyond product standardization of such aspects as quality and wholesomeness because two additional important aspects are also considered: (a) the packaged product with regard to size, volume, net weight, amount delivered, or the number of units per measure, and (b) the amount of fish or shellfish ingredients contained in certain fabricated or processed products. In our consideration of those two aspects, we encountered problems relating to glaze and breadding.

**PROBLEM OF GLAZE:** Four fishery products for which U. S. standards were developed presented a problem of ice glaze. Those products were halibut steaks, salmon steaks, sole and flounder fillets, and raw headless shrimp.

In the usual market form, those products are protected by a surface glaze of ice in addition to the packaging materials in which they are contained. To determine how much product is actually present, we had to develop and incorporate into the standards a specific procedure for determining the net weight. A slightly different procedure was required for each of the four products because of inherent differences.

In the standard for frozen halibut steaks, the consideration of glaze is unique in that excessive glaze is treated as a factor of quality. The maximum allowable amount of glaze to protect the product was established at 6 percent of the net weight. Beyond that percentage, it is considered to be excessive glaze, and the product is downgraded for quality.

**PROBLEM OF BREADDING:** Another fishery-products category that required special consideration was breaded and precooked products. That group includes breaded fish sticks, breaded shrimp, breaded fish portions, fried fish sticks, and fried fish portions. A problem of the "utility" of the packaged contents was encountered in developing those standards. This problem involved two factors: (1) loose breadding, and (2) excessive breadding.

**Loose Breadding:** During the processing of breaded and precooked products, any loosely adhering breadding is usually removed by passing the products over a vibrating large-mesh stainless-steel wire belt. When, however, samples of those products were obtained at the distribution level for evaluation during the early stages of developing the standards, substantial amounts of loose breadding were, in some instances, found in the package. This indicated either that good commercial practices had not been exercised in the processing of the product by eliminating the loose breadding, or that loose breadding was being added to meet the net-weight requirements when the weight of the contents were slightly under the declared net weight.



USDI Inspector debreading shrimp to determine the percentage of shrimp material.

This problem was resolved in the Standards for Breaded and Precooked Products by categorizing large amounts of loose breadding as a factor of quality. Those standards deduct points, depending upon the amount of loose breadding remaining in the package. The unit of measure used for determining excessive breadding is the teaspoon. Less than  $\frac{1}{2}$  teaspoon of

loose breadings is considered to be a "small amount"; and over  $\frac{1}{2}$  teaspoon is considered to be a "large amount."

**Excessive Breeding:** USDI Standards of Quality establish levels for the amount of fish meat required in breaded and precooked fishery products. The Bureau of Commercial Fisheries believes that it has a responsibility to the consumer to see that he gets a proportionately large amount of fish or shellfish ingredient in the breaded-type products.

In establishing the level of fish or shellfish content for a given product, we take a number of factors into consideration. The factors most frequently evaluated are flavor, appearance in both the raw and cooked states, texture, and the industry's capability evidenced by what has been marketed in the past.

When standards are developed for breaded products, a technique is also developed for determining the amount of the fish or shellfish ingredient that is present. This method, incorporated into the standard, involves the removal of the breading and a determination of the percentage of fish or shellfish ingredient by weight. The levels of the principal ingredient established in USDI Standards are given in the table.

Amounts of Fish or Shellfish Required in Breaded Products by USDI Standards	
Breaded Product	Relative Amount of Fish or Shellfish Required
	Percent
Fish portions . . . . .	75
Fish sticks . . . . .	72
Fried fish portions . . . . .	65
Fried fish sticks . . . . .	60
Fried scallops . . . . .	60
Shrimp . . . . .	50

#### RELATION OF WEIGHTS AND MEASURES TO VOLUNTARY INSPECTION SERVICE

Continuous inspection of processing operations is the major type of inspection services performed by the U. S. Department of the Interior (USDI). Under this type of service, the principal duties of the USDI inspector include (a) inspecting for plant sanitation, (b) examining the raw material for quality, (c) checking the processing technique, (d) determining the quality of the end product, and (e) certifying the product.

In the execution of all but the first of those duties, the USDI inspector is concerned with some aspect of weight or measurement. A review of the pertinent duties (b through e) will illustrate the degree of involvement of the inspector in weighing or measuring.

**EXAMINING THE RAW MATERIAL:** If we visit the breaded shrimp industry for a specific example of how the inspector examines incoming raw material, we find that the raw material usually comes to the plant in the form of 5-pound cartons of block-frozen raw headless shrimp. When those shipments arrive at the processing plant and before a settlement is made, the firm is interested in the quality of the shrimp and whether or not each 5-pound carton will actually deliver 5 pounds. The USDI inspector samples the shipment, examines the product, and determines the net weights of the selected packages, using the official method defined in the Quality Standard. The information he thus obtains is then provided to the firm and is used as a basis for a decision by the firm to accept or reject the shipment.

**CHECKING THE PROCESSING TECHNIQUE:** During the processing of products such as fish sticks and fish portions, the inspector frequently conducts line checks of the weight of a specific number of raw sticks or portions. This information is used as a guide to continuous product control in determining whether the amount of fish meat is adequate. To produce, for example, a 1-pound package of fish portions containing four 4-ounce pieces, the 4 unbreaded pieces of fish must weigh a minimum of 12 ounces in order for the final product to conform to the requirement of 75 percent of fish meat. Frequent weighing of 4 random pieces provides the information that the input weight of raw material is adequate and that the net weight will probably be adequate, since the batter and breading can be controlled very closely.

**DETERMINING THE QUALITY OF END PRODUCT:** End-product examination for quality by the inspector includes a determination of the amount of the product in the package. Samples for examination are drawn randomly during production in accordance with a sampling

plan so as to be representative of the lot. The net contents of each package is determined using the method defined in the U. S. Standard for the product being examined. The net content of each package is reported on the inspector's work sheet along with the other pertinent information found during the examination. An average calculated from the net weight of the individual packages indicates whether or not the lot complies with the net weight declared on the label.

**CERTIFYING THE PRODUCT:** In the certification procedure for fishery products, the pertinent information about the examined lot is recorded on an official inspection certificate. Those certificates of findings are admissible in all courts of the country as *prima facie* evidence. Two types of information about the contents of the packaged product are always given when fishery products are certified: (a) the net content as declared on the label, and (b) the determined average net content of the examined packages as observed by the inspector. When the net contents of one or more packages are found to deviate beyond the range of good commercial practice, such deviations are noted on the certificate for the benefit of the processor or buyer of the lot.

#### RELATION OF WEIGHTS AND MEASURES TO LABEL APPROVAL

Fishery product labels that are to bear inspection marks of the USDI must be reviewed and approved by the Bureau of Commercial Fisheries prior to use. The primary reason for reviewing the labels is to ensure that whatever reference is made to USDI inspection--either through a grade shield, inspection shield, or statement of inspection--is accurate and in accordance with USDI regulations.

The second reason for reviewing the labels is to ensure that USDI inspection marks will not be affixed to a label that is in violation of the mandatory requirements of the U. S. Food, Drug, and Cosmetic Act. The presence of a statement of net contents is one of several items that we ensure is on the label. However, it should not be construed that the USDI is determining that labels comply with the U. S. Food and Drug Act. Rather, it should be considered that this thorough label review is a service to the industry.

Although the USDI review program includes verification that the label bears a quantity statement, guidelines as to the prominence and placement of the quantity statement on the label have not been developed. This is a regulatory matter and is beyond the Bureau's authority. We believe, however, that this question of prominence and placement should be nationally coordinated with the various industry groups having an interest in it and that a single set of guidelines or regulations should be developed and adopted at all levels of government that regulate this activity.

In the past, the Bureau of Commercial Fisheries has cooperated fully with other governmental agencies and with industrial organizations where common interest exist. The Bureau plans to continue this policy of cooperation in the future. When difficulties or inconsistencies of any nature are encountered with fishery products, we suggest that the matter be brought to our attention.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



# TRENDS AND DEVELOPMENTS

## Alaska

### FOREIGN FISHING ACTIVITY OFF ALASKA, JULY 1964:

Soviet fishing activity decreased substantially in the waters off Alaska during July 1964. The same period in 1963 saw a general reduction in Soviet fishing efforts on Alaskan fishing grounds. However, while only about 50 Soviet vessels were active in 1964, nearly 200 Soviet vessels were in the same area a year earlier.

Japanese activity in the eastern Bering Sea was down to 4 factoryships and their catcher vessels. With the sale of Prince William Sound salmon to Japanese fishing companies, a number of vessels (including 5 stern trawlers) were diverted to that area to load fish.

U.S.S.R.: The major Soviet fishery off Alaska in July was the trawl fleet operating alternately between Albatross and Portlock Banks near Kodiak. That fleet was harvesting primarily Pacific ocean perch, with virtually no incidental species taken. Fleet gradually decreased and in July consisted of about 50 vessels of all types.



Fig. 1 - Soviet fishery transport vessel surrounded by factoryship and fishing vessels in the Bering Sea during early spring.

Three Soviet whale factory vessels and their accompanying killer vessels continued to operate in the Alaska area during the

month. Their operations were farther offshore than in previous years and hence outside United States patrol areas.

Japan: Eastern Bering Sea fishing activities by the Japanese were also reduced during July, as one of the remaining fish meal factoryships moved progressively northwest toward Siberia. The remaining fish meal and freezer vessel, with 28 trawlers, was last reported fishing in the vicinity of the Pribilof Islands.

The Japanese shrimp factoryship Einin Maru, accompanied by 12 trawlers, continued operations north of the Pribilofs during July.



Fig. 2 - Catch aboard a Japanese trawler operating in North Pacific and Bering Sea.

Three Japanese whaling fleets were operating from the vicinity of the Shumagin Islands westward along the Aleutian Chain during the month.

Only two Japanese vessels continued to fish in the Gulf of Alaska during July. The Tenryu Maru and the Kohoku Maru No. 2 were fishing for shrimp off Sitkalidak Island while the other vessels fishing in that area were diverted to Cordova to load salmon.

\* \* \* \* \*

**BRISTOL BAY RED SALMON RUN FAILS:**

The 1964 Bristol Bay red salmon fishery was officially labeled a disaster by the Alaska Department of Fish and Game. It was reported that the Naknek-Kvichak district had "absolutely failed." Preliminary data indicated that the Naknek segment was up to expectations and that the Kvichak River system accounted for the failure. All other major systems in the Bay produced reasonably close to the return forecast.

The predicted run for Bristol Bay had been placed at 17.4 million reds. Preliminary figures showed the run was slightly less than 11 million fish and was about equally divided between catch and escapement.

The 1963 Bristol Bay catch of 2.5 million red salmon was the lowest ever previously recorded for that area, and was also declared a complete failure.

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**SALMON WASTE UTILIZATION:**

Over the past few years increasing use has been made of salmon waste for food, pharmaceutical, and bait purposes. Salmon eggs were processed at several Alaska canneries this year as red caviar under Japanese technical supervision and for export to Japan. For that product, eggs are removed after the fish are headed, then transported in open mesh baskets to the packing plant where they are salt-cured. The eggs are first washed in salt water to remove most blood and slime. They are then placed in a saturated brine solution (containing mild-cure salt plus certain color additives) and agitated mechanically for 20 minutes. Egg skeins are then sorted, trimmed, and graded for packing under very close Japanese supervision. A solid pack is made by layering individual skeins of eggs in polyethylene-lined wooden boxes with a modest sprinkling of salt between layers. Apparently the salt at that stage is not measured. Each box holds 10 kilos (22 pounds). After packing, the boxes are cured at room temperature for about one week, again inspected, and then placed in storage at 40° F. for shipment to Japan.

At some plants milts are separated at the same time that eggs are removed from the salmon. Those are placed in 55-gallon drums and treated with 7 gallons of caustic soda solution (5 pounds per gallon) as a preservative and as a first step in their proc-

essing. These are used in the production of certain pharmaceutical products.

Significant amounts of salmon heads and tails are also set aside and sold for halibut bait in locations where the halibut fleet sells or takes on bait. The traditional preparation of salmon eggs for sport fishing bait continues to expand each year.

While some Alaska canneries do not prepare any of those byproducts, it is estimated that  $\frac{1}{4}$  to  $\frac{1}{2}$  of the salmon waste in Alaska will be processed and sold this year.

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**FILING OF FISHERY DISASTER  
LOAN APPLICATIONS ENDED  
SEPTEMBER 30, 1964:**

The last date for the acceptance of applications using the Alaskan disaster criteria for fishery loans from the U. S. Bureau of Commercial Fisheries was September 30, 1964. Those special loans were made at 3 percent interest to eligible applicants for the repair or replacement of commercial fishing vessels or fishing gear damaged or lost as a result of the March 27, 1964, Alaskan earthquake or tidal wave.

Note: See Commercial Fisheries Review, July 1964 p. 8.

**Alaska Fisheries Exploration  
and Gear Research****EXPLORATORY FISHING FOR  
SHRIMP AND SCALLOPS:**

Exploratory fishing for shrimp was continued by the U. S. Bureau of Commercial Fisheries chartered exploratory vessel *Paragon* with coverage as of July 1964 extending from Kodiak Island west to Unimak Pass and including the Shumagin Islands. Catches of over 2,000 pounds in a half-hour trawl drag have been recorded. Both flat and semiballoon 40-foot Gulf of Mexico shrimp trawls were used. Pink shrimp accounted for about 80 to 85 percent of the catches with varying amounts of side-stripe and coon-stripe showing on occasion. Exploratory drags using an eight-foot scallop dredge were made in numerous bays and channels in the Shumagin Islands area. Only a few scattered scallops were located; the largest catch being 16 medium scallop in a half-hour tow in Pavlov Bay. The vessel

Paragon was scheduled to move into the Bering Sea and Bristol Bay during August and September.



## Alaska Fisheries Investigations

### PINK SALMON NURSERY AREAS DISCOVERED:

The M/V Heron, accompanied by the 20-foot reconnaissance-catcher vessel Blue Boat, completed an 11-day cruise (July 7-17, 1964) through all major channels in northern Southeast Alaska and West Sumner Strait. The cruise was the second of a series to trace seaward migrations of juvenile salmon as they move through summer nursery areas to the Gulf of Alaska. The cruise was highly successful as weather conditions were ideal and all gear worked perfectly. Four major summer nursery areas were discovered and all observed salmon populations were easily sampled by round haul seine from Blue Boat. Catches ranged from several hundred to many thousands per set. The success of this project in observing and capturing samples from major populations of migrating pink salmon represents an important breakthrough in Alaskan pink salmon research, and will lead to a much better understanding of mortality after leaving the stream.

Major concentrations of juvenile pink, chum, and coho salmon were discovered in:

(1) West Kuiu Island from Saginaw Bay to Gedeney Harbor, with the population centered in Pillar Bay;

(2) Central Chatham Strait from Takatz Harbor to east Peril Strait, centered in Kelp Bay;

(3) West Icy Strait from Lisianski Inlet to Idaho Inlet, centered around Inian Islands;

(4) West Summer Strait from south Kelp Strait to Louise Cove, centered around Port Beauclerc.

Length-frequency measurements of pink and chum salmon from various locations showed that there are significant differences between size of fish from different areas. Those differences will be useful in later identifying populations in catches by the M/V Commander, a Fisheries Research Institute

vessel which was scheduled to begin sampling for juvenile salmon along the outside coast of Baranof Island about August 1. Icy Strait and central Chatham Strait juvenile pink salmon were the smallest, ranging in body length from 79 to 88 millimeters (3.1-3.5 inches); West Kuiu Island pinks ranged from 91 to 106 millimeters (3.6-4.2 inches); and West Sumner Strait pinks were from 112 to 136 millimeters (4.4-5.4 inches).



## Atlantic Fisheries

### Technological Conference

#### MEETING ON OCTOBER 11-14, 1964:

The eighth annual Atlantic Fisheries Technological Conference was held at Martha's Vineyard, Mass., on October 11-14, 1964. The meeting was attended by United States and Canadian fishery scientists from industry, research institutes, universities, and Government agencies.

More than 50 papers were offered; topics included sanitation problems in fisheries, preservation techniques, research programs and applications, quality measurements, and economics.



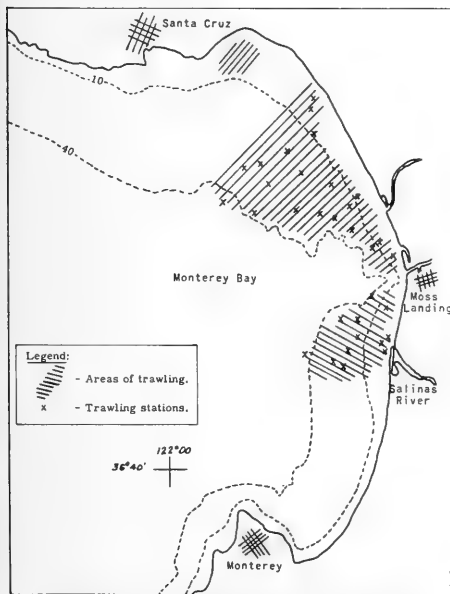
## California

### GROWTH STUDIES OF ENGLISH SOLE IN MONTEREY BAY:

M/V "Nautilus" Cruises 64-N-1a (February 4-7, 1964), 64-N-1b (April 7-10), 64-N-1c (June 9-12): To collect adult and juvenile English sole (*Parophrys vetulus*) in Monterey Bay in the vicinity of Moss Landing for use in a growth analysis study was the objective of these cruises by the California Department of Fish and Game research vessel Nautilus.

A 1½-inch mesh Gulf of Mexico shrimp otter trawl with a 1-inch mesh cod-end was used. Trawling was conducted on both sides of the Monterey Canyon in depths of 3 to 50 fathoms with each tow lasting about 20 minutes.

A total of 34 tows was made during the three cruises. Of the fish taken, the sex of 593 English sole was determined and they were also measured. These fish ranged from

Shows trawling areas of *Nautilus* Cruise 64-N-la-b-c.

96 to 456 millimeters in length (about 3.8 to 18.0 inches). An interopercle bone was taken from two fish of each sex in each centimeter group to be used for age determinations.

A sex determination was also made on samples of petrale sole (*Eopsetta jordani*) and Dover sole (*Microstomus pacificus*) taken during these cruises, together with their measurements.

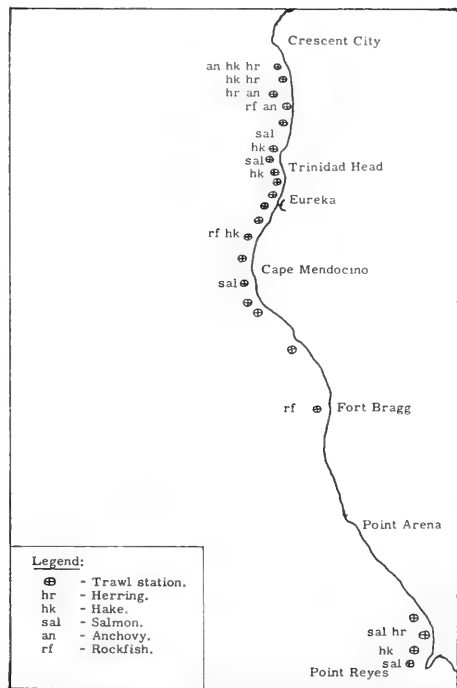
Note: See *Commercial Fisheries Review*, February 1964 p. 12.

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#### PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 64-A-3-Pelagic Fish (May 4-24, 1964): This cruise by the California Department of Fish and Game research vessel *Alaska* was conducted in the coastal waters of northern and central California between Crescent City and Monterey, and in the vicinity of Avila. The main objectives of the cruise were to:

1. Survey the pelagic environment in the northern parts of the present northern an-

Fig. 1 - Fishing area of *Alaska* during Cruise 64-A-3-Pelagic Fish.

chovy (*Engraulis mordax*) and Pacific sardine (*Sardinops caeruleus*) ranges.

2. Assess the density, age, and size composition of the anchovy population in Monterey Bay.

3. Collect anchovies for subpopulation studies.

4. Collect juvenile salmon for the Ocean Salmon Project.

Sampling was accomplished with a large midwater trawl fished from the surface to a depth of 20 fathoms, with each tow lasting from 20 to 40 minutes. The effectiveness of the survey was substantially reduced by the large concentrations of jellyfish (*Chrysaora gilberti*) which clogged the net, and by the weather which permitted trawling only during daylight hours.

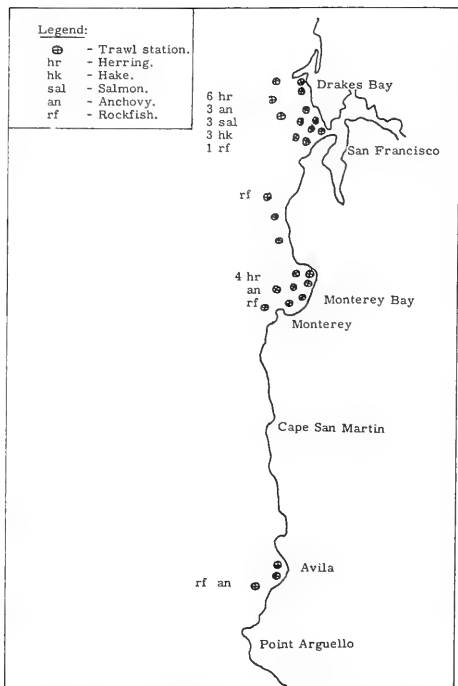


Fig. 2 - Fishing area of Alaska during Cruise 64-A-3-Pelagic Fish.

A total of 45 tows was completed between Crescent City and Monterey and 3 off Avila. The species commonly appearing in the catch with the number of trawls in which they occurred were: Pacific herring (*Clupea pallasii*) 14 fish, Pacific hake (*Merluccius productus*) 9, jacksmelt (*Atherinopsis californiensis*) 9, juvenile king salmon (*Oncorhynchus tshawytscha*) 8, northern anchovy 8, starry flounder (*Platichthys stellatus*) 7, juvenile rockfish (*Sebastes* sp.) 7, juvenile lingcod (*Ophiodon elongatus*) 6, and surf smelt (*Hypomesus pretiosus*) 5. Other species occurring less frequently included stickleback (*Gasterosteus aculeatus*), northern midshipman (*Porichthys notatus*), sand lance (*Ammodytes hexapterus*), wolf-eel (*Anarrhichthys ocellatus*), medusafish (*Icichthys lockingtoni*), cabezon (*Scorpaenichthys marmoratus*), whitebait smelt (*Allosmerus elongatus*), night smelt (*Spirinchus starksi*), and steelhead trout (*Salmo gairdneri*).

Pacific herring were caught in the greatest number and occurred most frequently in the catches. They were present in 29 percent of the trawls in numbers ranging from 1 to 15,000. The best catches were made within 2 miles of shore in very turbid water. The areas off the mouth of San Francisco Bay and along the inner part of Monterey Bay were the most productive. Sizes ranged from 37 to 230 millimeters (1.5 to 9.1 inches) standard length with most fish between 55 and 160 millimeters (2.2 to 6.3 inches). The largest catch, however, was comprised of small juveniles 37 to 70 millimeters (1.5 to 2.8 inches).

An adequate survey of the anchovy population was not possible during this cruise because of the necessity of trawling only during daylight hours. Previous experience has indicated that trawling at night is much more effective in sampling anchovies. Small amounts of juvenile anchovies were caught in 3 trawls between Crescent City and Eureka, while adults were caught in 3 trawls near San Francisco, 1 trawl in Monterey Bay, and 1 trawl near Avila. The adults were very large ranging from 135 to 163 millimeters (5.3 to 6.4 inches) long. Samples of the Monterey Bay catch were collected for blood genetic and electrophoretic studies.

Hake catches were spread over most of the survey area. Numbers were quite low, however, with over half of the catches amounting to a single fish; the best catch was 42 fish. Juvenile king salmon were taken off Cape Mendocino, Trinidad Head, and San Francisco. They ranged from 76 to 485 millimeters (3.0 to 19.1 inches) long, with up to 24 fish in a single trawl. Juvenile rockfish of several species were taken in quantity in 2 trawls, with catches of 500 and 4,700 fish, 43-65 millimeters (1.7 to 2.6 inches) long.

Large concentrations of jellyfish were present inshore from Drakes Bay to Monterey Bay. They seriously hampered trawl operations by clogging the net, causing heavy damage to the net and doors. Squid were caught in 7 trawls, with catches of up to 5,600 of them taken in Monterey Bay.

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Airplane Spotting Flight 64-8-Pelagic Fish (May 4-6, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Reyes, Marin County, to the United States-Mexican



Border was surveyed from the air by the California Department of Fish and Game's Cessna "182" 9042T.

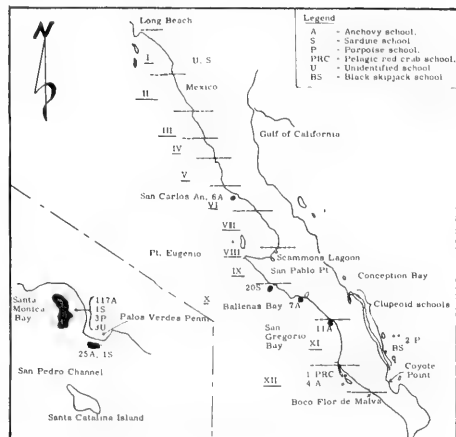
On May 4, the area from Point Reyes to Morro Bay was scouted but water and air visibility were fair to poor. A heavy, brown phytoplankton bloom, in the waters north of Pigeon Point, severely restricted water visibility. In the Monterey Bay area and south, the water was clear but low broken clouds hampered visibility. A total of 8 northern anchovy (*Engraulis mordax*) schools were sighted near the harbor entrance at Half Moon Bay. A Pacific pilot whale (*Globicephala scammoni*) and 2 unidentified fish schools were seen near Point Sur. At Monterey 3 purse seiners were setting on a large school of squid (*Loligo opalescens*) several hundred yards off Cannery Row.

On May 5, the area from Half Moon Bay to Santa Monica was scouted. The sky was overcast and a strong northwest wind was blowing. Water visibility was poor. One unidentified fish school was seen in Monterey Bay actively being worked on by sea birds.

On the last day of the survey the area from from Jalama Park to the United States-Mexican Border was scouted. Rain squalls were encountered near Jalama Park and the Border. Red tide was noted from Redondo Beach to La Jolla--the first big concentration this year. Five anchovy schools were seen in Fish Harbor, a part of the Los Angeles-Long Beach Harbor.

Airplane Spotting Flight 64-10-Pelagic Fish (May 18-21, 1964): To determine the inshore and offshore distribution and abundance of pelagic fish schools, the waters off southern California and Baja California were surveyed from the air by the California Department of Fish and Game's Beechcraft N5614D. The survey covered the offshore waters of southern California in the San Pedro Channel; the inshore waters from Long Beach, Calif., to Boca Flor de Malva, Baja California; and the waters of the Gulf of California from Coyote Point, La Paz Bay to Conception Bay.

This flight by the Beechcraft N5614D was the second of four experimental flights planned for this year along the Baja California coastline. The flights have been scheduled on a quarterly basis.



Pelagic fish survey Flight 64-10, May 18-21, 1964.

The area from San Pedro Channel and Santa Monica Bay was surveyed on May 18. On that day the offshore waters of southern California were covered by fog except for the San Pedro Channel and Santa Monica Bay. School groups of northern anchovies (*Engraulis mordax*) and two Pacific sardine (*Sardinops caeruleus*) schools were sighted in Santa Monica Bay and off the Palos Verdes Peninsula. They were the first sardines seen by air spotters in that area since February 1962.

On May 19, the area from Long Beach to Ballenas Bay, Baja California, was surveyed. A low, dense fog prevailed over most of the coastline from Long Beach to Punta Eugenio but south of Punta Eugenio visibility was excellent. A total of 20 sardine schools were sighted near San Pablo Point and 7 anchovy schools were seen in Ballenas Bay.

Punta San Juanico to Boca Flor de Malva, Coyote Point, La Paz Bay to Conception Bay, Gulf of California, were scouted on May 20. Intermittent fog was encountered from Punta San Juanico to Cabo San Lazaro. Visibility was good at Magdalena Bay and throughout the area flown in the Gulf of California. Anchovy schools were seen in San Gregorio Bay and outside Magdalena Bay. A large school of pelagic red crabs (*Pleuroncodes planipes*), covering an estimated five acres, was sighted in Magdalena Bay.

Many unidentified clupeoid schools were seen in the Gulf of California, and more than 1,000 schools in Concepcion Bay alone were seen that day. Those fish may have been round herring (*Etrumeus* sp.), thread herring (*Opisthonema* sp.), or flatiron herring (*Harengula* sp.). All of those species were found in quantities by the California Department of Fish and Game research vessel *Alaska* during a cruise in April. Also sighted were one black skipjack (*Euthynnus lineatus*) and two unidentified porpoise schools.

On the last day of the survey the area from Scammons Lagoon to Long Beach was scouted. Fog persisted over the inshore waters from the lagoon to the United States-Mexican Border except at San Carlos anchorage where 6 anchovy schools were counted. The air was hazy north of the border to Long Beach.

Note: See Commercial Fisheries Review, June 1964 p. 11.

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#### SURVEY OF SHRIMP RESOURCES IN NORTHERN AND CENTRAL COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 63-S-2-Shrimp (March 29-May 1, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel *N. B. Scofield* were to:

1. Locate concentrations of pink shrimp (*Pandalus jordani*) in Areas A, B-1, B-2, and C for population estimates.
2. Determine sizes, sex ratios, and weight of shrimp in each area.
3. Determine escapement of commercial size shrimp through  $1\frac{1}{2}$ -inch mesh cod-end of net.
4. Make bathythermograph and Nansen bottle casts for bottom temperatures and salinity samples in shrimp areas.
5. Identify, count, and weigh incidentally-caught fish species.
6. Collect specimens of cephalopods for special study.

A total of 139 tows were made in the combined survey areas in the coastal waters from Cape Ferrello, Oreg., to Pt. Sal, Santa Barbara County, Calif. A 41-foot headrope

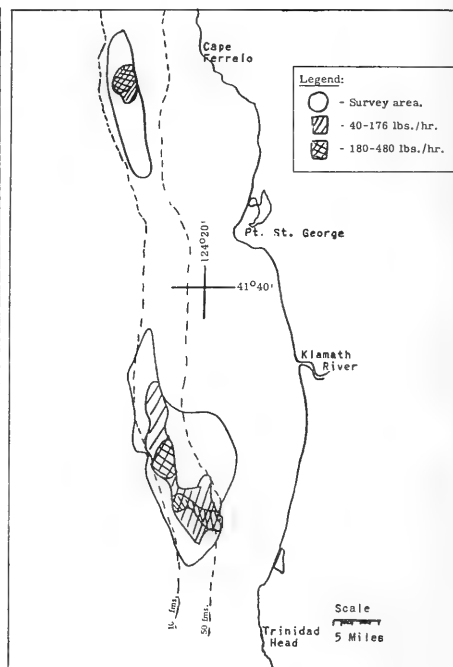


Fig. 1 - M/V *N. B. Scofield* Cruise 64-S-2, Area A.

Gulf of Mexico otter trawl having  $1\frac{1}{2}$ -inch stretch mesh in the cod-end was used. Of the 59 tows made in Area A, 39 were made with a  $\frac{1}{2}$ -inch stretched mesh liner on the cod-end to catch shrimp escaping from the main net. Preliminary analysis of data showed that few commercial size shrimp were lost.

AREA A: Between Cape Ferrello, Oreg., and Trinidad Head, Calif. (fig. 1), a total of 59 tows of 15 minutes duration each was made in depths of 40 to 94 fathoms. Shrimp were caught at an average rate of 73 pounds an hour, ranging from none to 480 pounds an hour. The population of Area A is estimated to contain 530,000 to 750,000 pounds. Shrimp sizes (heads-on) ranged from 55 to 169 a pound with an average of 125.

The year-class composition was:

Age Group	Percentage by No.	Percentage by Weight
1 (1963)	43	24
11 (1962)	57	75
111 (1963)	Trace	1

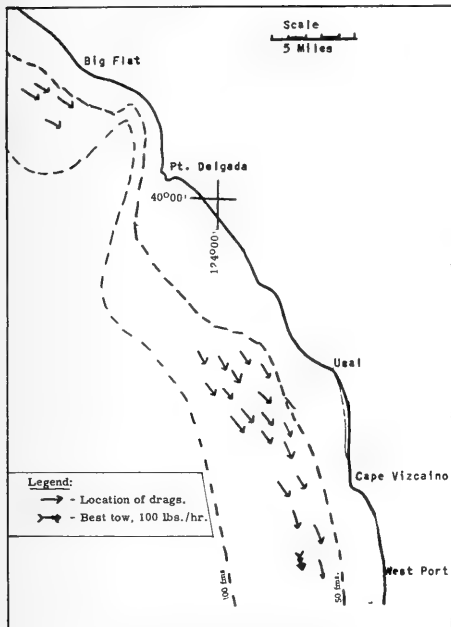


Fig. 2 - M/V N. B. Scofield Cruise 64-S-2, Area B-1.

Only 9 percent of the female shrimp examined were gravid. The incidental fish catch was light, consisting mostly of eulachon (*Thaleichthys pacificus*), slender sole (*Lyopsetta exilis*), and rex sole (*Glyptocephalus zachirus*). Bottom water samples were obtained at 11 stations for salinity determinations. A total of 29 bathythermograph (BT) casts were made. Bottom temperatures ranged from 7.2° to 8.5° C. (45.0° to 47.3° F.); surface temperatures from 8.8° to 10.5° C. (47.8° to 50.9° F.).

An evaluation of the 1964 Area A fishery, made in the fall of 1963 (N. B. Scofield Cruise 63-S-6 and Ocean Shrimp Report for the 1963 season) was accurate. The evaluation forecast a poor season due to weak 1962 and 1963 year-classes. The heavy 1962 landings caused an extreme reduction in the spawning stock. This, it is believed, accounts for the small 1963 year-class.

AREA B-1: A total of 25 tows made from Big Flat to Westport (fig. 2) in 43 to 82 fathoms did not take shrimp in commercial quantities. The best tow yielded 100 pounds an

hour. The shrimp ranged from 70 to 110 to the pound and averaged 81 shrimp. Only 1 tow yielded more than 1 pound of shrimp. Surface temperatures ranged from 7.8° to 9.0° C. (46.0° to 48.2° F.) and bottom temperatures ranged from 6.9° to 7.8° C. (44.4° to 46.0° F.). Thirteen BT casts were made and 10 water samples were obtained. Fish catches were light with rex sole, sanddab (*Citharichthys sordidus*), and slender sole dominant.

AREA B-2: Shrimp were not found in commercial quantities in Area B-2. A total of 46 tows lasting 15-minutes each from Stewart's Point to Bodega Head (fig. 3) in 26 to 72 fathoms failed to locate shrimp in quantity. The best two tows yielded 25 pounds in 15 minutes in the depth range of 44 to 47 fathoms off Duncan's Landing

The year-class composition was:

Age Group	Percentage by No.	Percentage by Weight
1 (1963)	26	15
11 (1962)	74	85

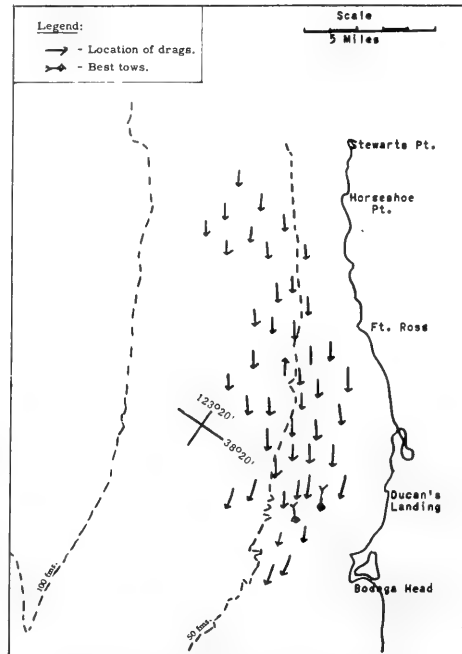


Fig. 3 - M/V N. B. Scofield Cruise 64-S-2, Area B-2.

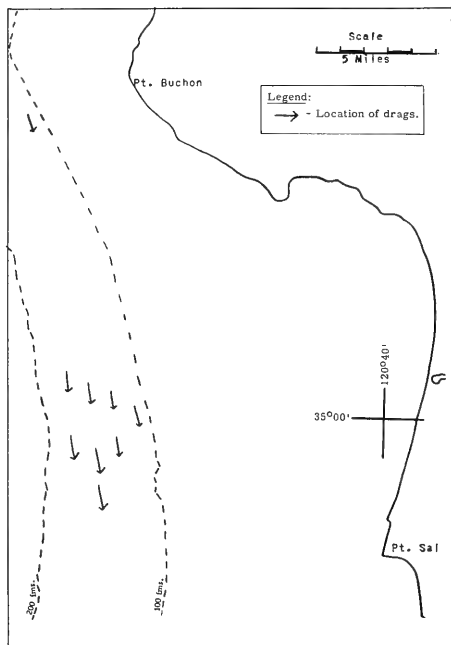


Fig. 4 - N. B. Scofield Cruise 64-S-2, Area C.

None of the female shrimp examined was gravid. Fish catches were light with rex sole, sanddab, slender sole, and hake (*Merluccius productus*) taken at most stations.

A total of 25 (BT) casts were made; surface temperatures ranged from 8.8° to 10.3° C. (47.8° to 50.6° F.) and bottom temperatures from 7.5° to 8.5° C. (45.5° to 47.3° F.). Water samples for salinity determinations were collected at 14 stations.

AREA C: A total of 9 tows was made in this area (fig. 4). Four BT casts were made and 2 water samples were taken. Only 42 shrimp were caught, but a large part of the shrimp-habitable grounds was unexplored because rough seas cut down activities.

Some squid and octopus taken on this cruise were delivered to the California Department of Fish and Game Laboratory at Terminal Island. Skates (*Raja* sp.) were col-

lected during this cruise for the Los Angeles County Museum.

Note: See Commercial Fisheries Review, March 1964 p. 14; December 1963 p. 21.

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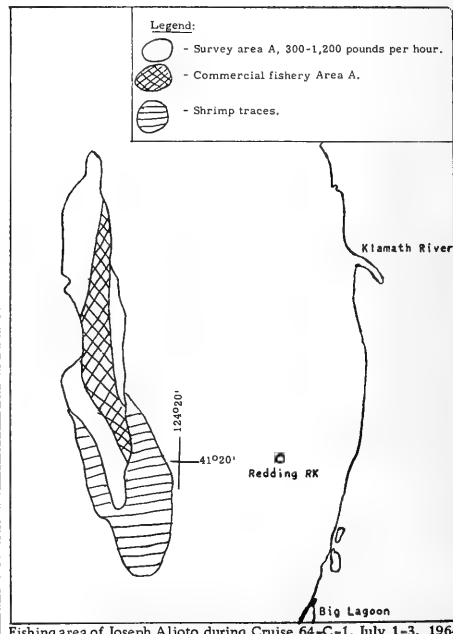
M/V "Joseph Alioto" Cruise 64-C-1-Shrimp (July 1-3, 1964): The objectives of this cruise by the California Department Fish and Game chartered research vessel Joseph Alioto in the coastal waters off northern California from Rocky Point to Crescent City were to:

(1) Locate concentrations of pink shrimp (*Pandalus jordani*) for population estimates and determining natural mortality rates.

(2) Determine sex ratio and year-class composition of shrimp.

(3) Count and weigh incidentally-caught fish.

AREA A: A total of 22 30-minute tows and one 120-minute tow was made with a commer-



Fishing area of Joseph Alioto during Cruise 64-C-1, July 1-3, 1964.

cial Gulf of Mexico shrimp trawl with a head-rope 80 feet long, and 1½-inch mesh in the cod-end. The estimated width of the opening of the net when fishing was 45 feet. The tows were made in the same locations as the tows made by the vessel N. B. Scofield during Cruise 63-S-2 (March 29-May 1, 1964), with the exception that no tows were made in the area being fished by the commercial shrimp fleet.

To estimate the shrimp population in the commercial fishing area, 32 tows made by the commercial fleet were used. All tows were in the 49- to 90-fathom depth range. The total area of the shrimp bed is estimated to cover 50.2 square miles, and to contain a little more than 2.2 million pounds of shrimp. Some 450,000 pounds had already been harvested by California commercial fishing vessels since the season opened on May 1, 1964. About 100,000 pounds were taken by vessels operating out of Brookings, Oreg.

The year-class composition was:

Year-Class	Percentage
I	45.3
II	52.0
III	2.7

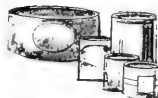
Shrimp sizes ranged from 70 to 128 to the pound heads-on. Hake (*Merluccius productus*) and rockfish (*Sebastes* sp.) dominated the fish catch. Stomachs of the hake were full of young-of-the-year shrimp.



## Cans--Shipments for Fishery Products, January-June 1964

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-June 1964 was down 6.4 percent from that used during the same period in 1963. The decline was due partially to a drop in the canning of jack mackerel and Maine sardines.

In January-June 1964, shipments to the Pacific or Western Area accounted for 69.2 percent of total shipments; shipments to the Eastern Area accounted for 26.8 percent; and shipments to the Southern Area accounted for most of the remaining 4.0 percent. Most of the fish-canning facilities are located in the Pacific Area.



Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

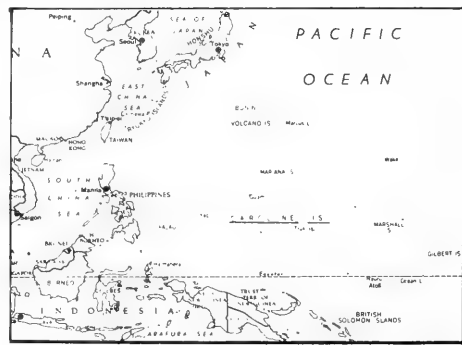
(2) See *Commercial Fisheries Review*, Sept. 1964 p. 14; July 1964 p. 9.



## Caroline Islands

### U. S. TUNA FISHING BASE IN PALAU ISLANDS PLANNED:

A United States west coast tuna-canning firm, which plans a tuna fishing and freezing base at Koror, Palau Islands, chartered the M/S Jaglaxmi (17,000-ton freighter) to deliver 610 tons of machinery and supplies to the base this past spring. The equipment arrived in April 1964.



U. S. Domestic Shipments of Metal Cans for Fishery Products, January-June 1963 and 1964  
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		January-June	
	1964	1963	1964	1963	1964	1963
East/ . . . . .	187,707	155,814	173,530	215,924	361,237	371,738
Southern . . . . .	24,761	21,010	28,390	38,197	53,151	59,207
North Central . . . . .	492	29	219	5	711	34
West/ . . . . .	359,947	381,735	574,448	629,376	934,395	1,011,111
Total all areas . . . . .	572,907	558,588	776,587	883,502	1,349,494	1,442,090

1/Includes Puerto Rico.

2/Includes Alaska and Hawaii.

The firm's construction engineer arrived in Palau at about the same time to build a 1,500-ton cold-storage and freezer facility, ice-making machines, water-storage tanks, and offices for the new plant which was expected to be operating by July 1964.

Six 25-ton tuna vessels were to begin operating from Koror's main port with 72 Okinawans and 48 Palauans as crew and fishermen.

Under the provisions of the contract signed by Trust Territory officials and the United States firm, Palauans or other Micronesians will be trained as tuna fishermen. Eventually, all of the vessels are to be manned by Micronesians. The Palau Islands are part of the Caroline Islands group in the United States Trust Territory of the Pacific. (*Pacific Islands Monthly*, May 1964.)



### Central Pacific Fisheries Investigations

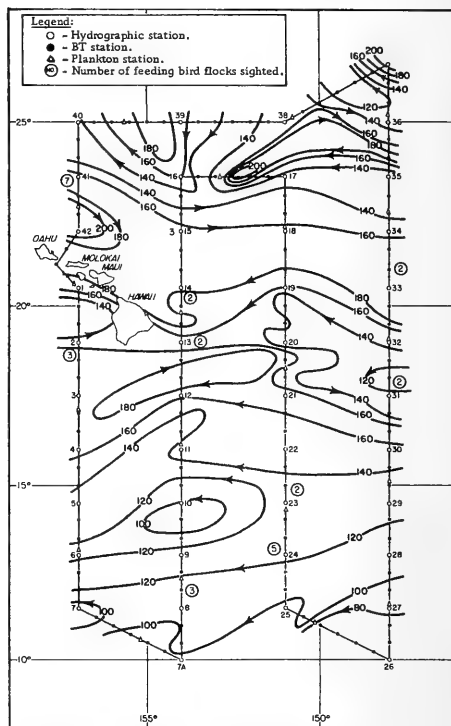
#### TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

*M/V "Townsend Cromwell" Cruise 5 (June 15-July 5, 1964):* To determine the rate of change in the distribution of properties in the trade wind zone of the central North Pacific was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel *Townsend Cromwell*. The cruise was the fifth in a series of oceanographic cruises designed to investigate the relationship between wind and ocean currents.

The area of operations in the central North Pacific was bounded by latitudes  $10^{\circ}$  N.,  $27^{\circ}$  N., and longitudes  $148^{\circ}$  W.,  $158^{\circ}$  W. During this cruise, a total of 43 oceanographic stations were occupied along the cruise track (chart). Temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters at each station.

Bathythermograms (BT's) were obtained at 30-mile intervals along the cruise track. Between stations 19 and 21, 26 and 28, 35 and 37, BT casts were made at 10-mile intervals.

At  $24^{\circ}00'$  N.,  $147^{\circ}54'$  W., between stations 35 and 36, subsurface current measurements with a current meter were attempted while



Track chart of the research vessel *Townsend Cromwell* Cruise 5 (June 15-July 5, 1964), showing depth contours of the  $200^{\circ}$  C. isotherm in meters.

drifting relative to a parachute drogue set at 1,200 meters. But after only one lowering, the meter became inoperative and the station was abandoned.

During the cruise, a total of 10 plastic-enclosed drift cards were released at 30-mile intervals along the entire cruise track and at 1-hour intervals during the first and last 12 hours of the cruise. Radiation from sun and sky was measured and recorded daily with a pyrheliometer. Colored photographs of cloud formations were made daily.

A standard watch for bird flocks and fish schools was maintained by vessel personnel during daylight hours. In addition, observers aboard the vessel from the Smithsonian Institution maintained their own watch for birds.

In addition to the cruise track, the chart shows the current pattern within the survey region as inferred from the uncorrected field plots of the distribution of the depth of the 20° C. isotherm. The flow pattern is similar to that obtained from the Townsend Cromwell's cruise 4 (May 14-June 5, 1964); however, between stations 12 and 13 the counterclockwise eddy noted during cruise 4 was replaced by a large clockwise eddy. To the east of this feature counterclockwise flow exists, suggesting that those eddies are moving through the region, which would explain the reversal of flow between stations 12 and 13.

A total of 26 unidentified fish schools and 5 skipjack tuna schools were sighted during the cruise. No apparent relation was found between the occurrence of fish schools and the features of the circulation pattern shown on the track chart.

Note: See Commercial Fisheries Review, September 1964 p. 15; August 1964 p. 17.



## Clams

### SANITATION QUALITY STUDY IN THE MIDDLE ATLANTIC AREA:

A joint study by New Jersey, New Jersey, and the U. S. Public Health Service to investigate the effect of harvesting, processing,

and marketing upon the bacteriological quality of the surf clam was started on July 13, 1964. At that time, personnel from the U. S. Public Health Service Northeast Shellfish Sanitation Research Center, Narragansett, R. I., boarded a clam dredging vessel at Point Pleasant, N. J., for a week to observe harvesting practices and to establish a working routine for standardized field procedures.



## Federal Purchases of Fishery Products

### DEPARTMENT OF DEFENSE PURCHASES:

#### January-July 1964: FRESH AND FROZEN:

For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in July 1964 than in the previous month. The decline was 19.7 percent in quantity and 19.9 percent in value. Compared with the same month in the previous year, purchases in July 1964 were up 9.0 percent in quantity and 17.6 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, July 1964 with Comparisons

QUANTITY				VALUE			
July		Jan.-July		July		Jan.-July	
1964	1963	1964	1963	1964	1963	1964	1963
..... (1,000 Lbs.) .....				..... (\$1,000) .....			
2,128	1,953	15,514	13,831	1,170	995	8,213	7,768

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, July 1964 with Comparisons

Product	July				January-July	
	1964		1963		1964	1963
	Quantity Pounds	Cost Cents/Pound	Quantity Pounds	Cost Cents/Pound	Quantity Pounds	Quantity Pounds
<b>Shrimp:</b>						
raw headless.....	88,900	84.1	1/	1/	798,450	1/
peeled and deveined.....	103,568	107.2	1/	1/	608,714	1/
breaded.....	300,200	68.7	1/	1/	2,518,900	1/
molded and breaded.....	47,500	57.1	1/	1/	274,770	1/
Total shrimp.....	540,168	77.6	540,629	79.4	4,200,834	3,684,492
Scallops.....	249,660	57.4	293,486	47.8	1,990,860	1,650,365
<b>Oysters:</b>						
Eastern.....	45,844	97.1	1/	1/	511,630	1/
Pacific.....	15,200	58.9	1/	1/	172,472	1/
Total oysters.....	61,044	87.6	118,429	89.0	684,102	661,989
Clams.....	10,236	30.0	31,790	30.1	181,809	161,682
<b>Fillet:</b>						
Cod.....	40,200	26.5	45,718	29.1	281,666	421,321
Flounder and sole.....	232,600	28.8	208,730	29.3	2,037,766	1,985,134
Haddock.....	240,500	29.2	170,006	32.1	1,265,104	1,388,433
Ocean perch.....	176,800	25.0	392,098	28.7	2,123,920	2,303,532
<b>Steaks:</b>						
Halibut.....	128,300	40.2	86,348	39.5	760,072	812,177
Salmon.....	16,300	68.8	13,993	58.6	125,225	114,181
Swordfish.....	500	46.4	2,700	53.7	8,430	19,730

1/Breakdown not available.

2/Revised.

Total purchases in the first 7 months of 1964 were up 12.2 percent in quantity and 5.7 percent in value from those in the same period of 1963. In January-July 1964, there were larger purchases of shrimp and scallops, but noticeably lower purchases of cod fillets, haddock fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, July 1964 with Comparisons									
Product	QUANTITY				VALUE				
	July		Jan.-July		July		Jan.-July		
	1964	1963	1964	1963	1964	1963	1964	1963	
	.. (1,000 Lbs.) ..				.. (\$1,000) ..				
Tuna	1/	174	2,617	2,064	2/	81	1,201	1,007	
Salmon	-	2	679	18	-	2	416	12	
Sardine	21	24	175	321	10	9	111	131	
1/ Less than 500 pounds.									
2/ Less than \$500.									

1/ Less than 500 pounds.  
2/ Less than \$500.

**CANNED:** In the first 7 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 46.3 percent in quantity and 50.3 percent in value from those in the same period of 1963. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.

#### January-June 1964: FRESH AND FROZEN: For the use of the Armed Forces un-

Table 4 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, June 1964 with Comparisons									
QUANTITY					VALUE				
June		Jan.-June			June		Jan.-June		
1964	1963	1964	1963		1964	1963	1964	1963	
(1,000 Lbs.)					(\$1,000)				
2,651	2,024	13,386	11,878		1,462	1,078	7,043	6,773	

der the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in June 1964 than in the previous month. The increase was 19.9 percent in quantity and 30.2 percent in value. Compared with the same month in the previous year, purchases in June 1964 were up 31.0 percent in quantity and 35.6 percent in value due mainly to larger purchases of shrimp, oysters, flounder and sole fillets, and ocean perch fillets. Average prices were somewhat lower for most of the items purchased in larger quantity in June 1964. On the other hand, a decline in scallop purchases corresponded with an increase in average scallop prices this June.

Total purchases in the first 6 months of 1964 were up 12.7 percent in quantity and 4.0 percent in value from those in the same period of 1963. In January-June 1964, there were larger purchases of shrimp, scallops, oysters, and clams, but noticeably lower purchases of cod fillets, haddock fillets, halibut steaks, and swordfish steaks.

**CANNED:** Tuna was the most important item among the canned purchases in June 1964.

Table 6 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, June 1964 with Comparisons									
Product	QUANTITY				VALUE				
	June		Jan.-June		June		Jan.-June		
	1964	1963	1964	1963	1964	1963	1964	1963	
	••• (1,000 Lbs.) •••				••• (\$1,000) •••				
Tuna	775	427	2,617	1,890	386	203	1,201	926	10
Salmon	1/	2	679	16	2/	1	416	10	
Sardine	27	55	154	297	11	21	101	122	
1/ Less than \$500 pounds. 2/ Less than \$500.									

1/ Less than 500 pounds.  
2/ Less than \$500.

Table 5 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, June 1964 with Comparisons						
Product	June				January-June	
	1964		1963		1964	1963
	Quantity Pounds	Cost Cents/Pound	Quantity Pounds	Cost Cents/Pound	Quantity Pounds	Quantity Pounds
<b>Shrimp:</b>						
raw headless.....	185,200	91.5	1/	1/	709,550	1/
peeled and deveined.....	127,676	113.5	1/	1/	505,146	1/
breaded.....	592,420	70.3	1/	1/	2,445,970	1/
<b>Total shrimp</b>	<b>905,296</b>	<b>80.7</b>	<b>633,894</b>	<b>85.0</b>	<b>3,660,666</b>	<b>3,143,863</b>
<b>Scallops.....</b>	<b>347,100</b>	<b>58.4</b>	<b>411,060</b>	<b>43.8</b>	<b>1,741,200</b>	<b>1,356,879</b>
<b>Oysters:</b>						
Eastern.....	63,296	94.8	1/	1/	465,786	1/
Pacific.....	52,108	58.3	1/	1/	157,272	1/
<b>Total oysters</b>	<b>115,404</b>	<b>78.3</b>	<b>44,861</b>	<b>99.5</b>	<b>623,058</b>	<b>543,560</b>
<b>Clams.....</b>	<b>30,040</b>	<b>31.8</b>	<b>10,308</b>	<b>30.7</b>	<b>171,573</b>	<b>129,892</b>
<b>Fillets:</b>						
Cod.....	44,850	26.0	75,662	27.7	241,466	375,603
Flounder and sole.....	294,350	29.4	242,580	32.8	1,805,166	1,776,404
Haddock.....	161,790	29.2	171,853	31.1	1,024,604	1,218,427
Ocean perch.....	424,100	24.9	249,462	29.8	1,947,120	1,911,434
<b>Steaks:</b>						
Halibut.....	103,050	38.8	113,349	39.6	631,772	725,829
Salmon.....	18,296	72.4	10,693	63.8	108,925	100,188
Swordfish.....	1,110	49.0	3,158	2/	7,930	17,030
1/Breakdown not available.						
2/Not available.						

1/ Breakdown not available.  
2/ Not available.



**FREEZE-DRIED:** Fishery purchases for the Armed Forces in June 1964 included 849 pounds of freeze-dried shrimp with an average value of \$10.40 a pound.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, Aug. 1964 p. 20.



## Great Lakes

### AID UNDER NEW FISHERIES LAW GIVEN GREAT LAKES AREA:

To assist the Great Lakes area fishing industry recover from economic losses suffered in 1963, the Secretary of the Interior has taken action under provisions of a new law.

Section 4(b) of Public Law 88-309 (Commercial Fisheries Research and Development Act) signed by the President on May 20, 1964, provides that the Secretary may make available up to \$400,000 to aid a fishing industry when he determined that a commercial fishery failure due to a resource disaster has occurred.

The Secretary has determined that the Great Lakes fishing industry, as well as processors and distributors of smoked fish from the Great Lakes area, incurred substantial economic injury in October 1963 as a result of a temporary loss of market for smoked fish. About 2 million pounds of frozen fish on hand at the time of the incident were still in storage. Because of the length of storage, the fish, even though frozen, deteriorated to a point where they could not be used for human food, or, for the most part, even for pet food. Those stocks were to be removed from normal trade channels and could be used only for fish meal or destroyed. The applicable section of the new law provides that funds available in fiscal year 1965 be used to alleviate the serious situation in the Great Lakes area.

In subsequent years, such funds will be available to other segments of the industry suffering fishery failures arising from resource disasters.

Note: See pp. 85-86 of this issue.

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### COMMERCIAL FISHERY LANDINGS, 1963:

United States Great Lakes commercial fishery landings in 1963 totaled 55.8 million pounds (valued at \$5.1 million ex-vessel), a decline of 9.7 percent in quantity (the value was down about \$234,000) from 1962. The 1963 landings were lower in all of the lakes except Lake Ontario (fished mostly by Canada).



Fig. 1 - The Great Lakes showing connecting channels.

Lake Michigan was the largest producer for United States fishermen in 1963 with 21 million pounds or nearly 38 percent of the total United States Great Lakes landings, but the catch from that lake was down 10.5 percent from the previous year. Chub was the leading species for a total of 7.5 million pounds--down about 3.7 million pounds from 1962 as a result of adverse economic conditions in the smoked fish industry during the latter part of the year when fishing for chubs virtually ceased. (The Great Lakes chub is used exclusively by the smoked fish industry.)

Lake Erie landings in 1963 amounted to 17.2 million pounds, down 12.3 percent from the previous year principally because of a decline in catches of yellow perch and carp. The 1963 landings of 12.1 million pounds from Lake Superior were down 4 percent from 1962

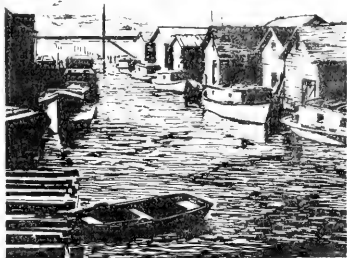


Fig. 2 - Great Lakes fishing village with fishing vessels at anchor.

and those from Lake Huron of 5.2 million pounds declined 11 percent from the previous year.

Canada's 1963 Great Lakes commercial fishery landings of 44.8 million pounds (preliminary data) were 17.9 percent lower than the previous year, but the ex-vessel value of \$4.2 million was about 3 percent higher than in 1962. Lake Erie accounted for about 80 percent of the total Canadian Great Lakes commercial fish landings in 1963, but the Canadian fish catch from that lake was about 9 million pounds below 1962. The smelt catch was down sharply in 1963 (from 19.1 million pounds in 1963 to 10.6 million pounds in 1962) and the Canadian yellow perch catch of 18 million pounds was 2.9 million pounds less than 1962.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-19 (July 9-19, 1964): Shrimp sampling in the northwest Gulf of Mexico was continued during this cruise by the chartered research vessel Gus III, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Shrimp sampling was conducted in 8 statistical areas from off the coast of

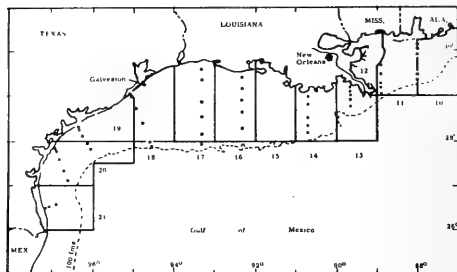


Trawler Gus III (85 feet) is chartered by the U. S. Bureau of Commercial Fisheries and used by the Bureau's Galveston (Tex.) Biological Laboratory scientists for shrimp studies in the northern Gulf of Mexico.

Louisiana to Texas with standard 3-hour tows using a 45-foot shrimp trawl.

During this cruise, the scientists made a total of 35 tows with the flat trawl, 50 plankton tows, and 44 bathythermograph and 41 nansen bottle casts.

Areas 18, 19, and 20 yielded the largest catches of brown shrimp (31-40 count) from the 10- to 20-fathom depth range. The most productive tow was from area 18 with a total of 91 pounds of that size brown shrimp. Those areas combined also yielded 23 pounds of large white shrimp (ranging from 12-20 count) from the under 10-fathom depth, and a smaller quantity of medium size (12-40 count) pink shrimp.



Shows station pattern of Gus III during Cruise GUS-19, July 9-19, 1964.

Large brown shrimp (20 pounds of 15-20 count) were caught in the over 20-fathom depth of area 13. Other depths in that area yielded only fair amounts of smaller brown shrimp and a few pounds of large white shrimp from the under 10-fathom depth.

A total of 67 pounds of shrimp was taken from area 16 with large (12 to 20 count) brown and white shrimp predominating. These were from depth ranges of up to 10 fathoms and over 20 fathoms. The 10- to 20-fathom depth in that area yielded less than one pound of shrimp.

The smallest yield during the cruise was from area 14--about 11 pounds of brown shrimp, mostly 51-67 count.

Note: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Sept. 1964 p. 23.



## Industrial Fishery Products

## U.S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, July 1964: Preliminary data on U.S. production of fish meal, oil, and solubles for July 1964 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production <sup>1/</sup> of Fish Meal, Oil, and Solubles by Areas, July 1964 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles	Homogenized <sup>3/</sup>
July 1964:			... (Short Tons) ...	
East & Gulf Coasts...	37,771	28,321	16,332	-
West Coast <sup>2/</sup>	3,302	3,522	1,306	-
Total...	41,073	31,843	17,638	-
Jan.-July 1964				
Total...	125,039	106,740	52,003	-
Jan.-July 1963				
Total...	128,293	99,688	50,133	6,372

<sup>1/</sup>Does not include crab meal, shrimp meal, and liver oils.

<sup>2/</sup>Includes American Samoa and Puerto Rico.

<sup>3/</sup>Includes condensed fish.

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Production, June 1964: During June 1964, a total of 43,604 tons of fish meal and scrap and 40.2 million pounds of marine animal oils was produced in the United States. Compared with June 1963 this was an increase of 8,741 tons in meal, and over

U.S. Production of Fish Meal, Oil, and Solubles, June 1964 <sup>1/</sup> with Comparisons				
Product	June		Jan.-June	
	1/1964	1963	1/1964	1963
	(Short Tons)			
Fish Meal and Scrap:				
Herring	1,256	299	1,684	299
Menhaden <sup>2/</sup>	37,035	29,182	63,021	68,597
Tuna and mackerel	1,870	935	8,466	10,369
Unclassified	3,443	4,443	10,795	11,787
Total	43,604	34,863	83,966	91,052
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/
Grand total meal and scrap	3/	3/	3/	3/
Fish Solubles:				
Menhaden	14,475	12,259	25,120	26,977
Other	2,316	1,830	9,245	12,007
Total	16,791	14,089	34,365	38,984
Homogenized condensed fish	-	1,341	-	3,841
	(1,000 Pounds)			
Oil, body:				
Herring	1,962	448	2,148	494
Menhaden <sup>2/</sup>	37,243	26,701	68,732	64,901
Tuna and mackerel	424	269	1,758	1,652
Other (including whale)	601	775	2,259	2,542
Total oil	40,230	28,193	74,897	69,589

<sup>1/</sup>Preliminary data.

<sup>2/</sup>Includes a small quantity of thread herring.

<sup>3/</sup>Not available on a monthly basis.

12.0 million pounds in oil production. Fish solubles production amounted to 16,791 tons--an increase of 2,702 tons compared with June 1963.

Menhaden meal production for June 1964 amounted to 37,035 tons--an increase of 7,853 tons compared with June 1963, and menhaden oil totaled 37.2 million pounds--an increase of 10.5 million pounds over June 1963. Tuna and mackerel meal production amounted to 1,870 tons--an increase of 931 tons compared with June 1963. Oil produced from tuna and mackerel amounted to 424,000 pounds--an increase of 155,000 pounds compared with June 1963. Herring meal production (1,256 tons) showed an increase of 957 tons, and herring oil production amounted to about 2.0 million pounds.

\*\*\*\*\*

Production, May 1964: During May 1964, a total of 27,304 tons of fish meal and scrap and 29.4 million pounds of marine-animal oils was produced in the United States. Compared with May 1963, this was a decrease of 12,598 tons in meal, and a decrease of 4.1 million pounds in oil. Fish solubles amounted to 11,736 tons--a decrease of 4,011 tons.

Menhaden meal production for May 1964 amounted to 22,664 tons--a decrease of 11,760 tons as compared with May 1963. The menhaden oil production amounted to 28.5 million pounds--a decrease of 4.0 million pounds. Tuna and mackerel meal production amounted to 1,389 tons for May 1964--a decrease of 874 tons, while oil (222,000 pounds) produced from tuna and mackerel showed a slight increase of 9,000 pounds over May 1963.

A total of 59,543 tons of fish meal was imported during May 1964--an increase of 29,144 tons as compared with May 1963. Imports of fish meal for the first 5 months in 1964 amounted to 221,914 tons--an increase of 58,432 tons as compared with the same period in 1963. Imports from Peru for January through May 1964 amounted to 181,196 tons--an increase of 55,198 tons as compared with the same period in 1963.

U.S. Production of Fish Meal, Oil, and Solubles, May 1964 <sup>1/</sup> with Comparisons				
Product	May		Jan. May	
	1/1964	1963	1/1964	1963
	(Short Tons)			
Fish Meal and Scrap:				
Herring	-	-	2/	-
Menhaden <sup>3/</sup>	22,664	34,424	25,886	39,415
Sardine, Pacific	-	-	-	1
Tuna and mackerel	1,389	2,263	6,596	9,430
Unclassified	3,251	3,215	7,779	7,344
Total	27,304	39,902	40,362	56,189
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/
Grand total meal and scrap	4/	4/	4/	4/
Fish solubles:				
Menhaden	9,320	12,882	10,645	14,718
Other	2,416	2,865	6,929	10,177
Total	11,736	15,747	17,574	24,895
Homogenized condensed fish	-	1,250	-	2,500
	(1,000 Pounds)			
Oil, body:				
Herring	28,482	32,500	31,489	38,200
Menhaden <sup>3/</sup>	222	213	1,334	1,383
Tuna and mackerel	222	831	1,845	1,813
Other (including whale)	-	-	-	-
Total oil	29,426	33,544	34,668	41,396

<sup>1/</sup>Preliminary data.

<sup>2/</sup>Included in "other" or "unclassified."

<sup>3/</sup>Includes a small quantity of thread herring.

<sup>4/</sup>Not available.

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Major Indicators for U. S. Supply, June 1964: United States production of fish meal in 1964 was higher by 25.1 percent as compared with June 1963. Production of fish oil was up by 47.7 percent and that of fish solubles increased 8.8 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, June 1964					
Item and Period	1/1964	1963	1962	1961	1960
(Short Tons) . . . . .					
<b>Fish Meal:</b>					
Production:					
June	43,604	34,863	61,171	54,399	44,311
January-May 2/	40,362	56,189	60,665	48,103	35,920
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
June	34,515	18,452	26,453	19,317	11,178
January-May	221,914	163,482	114,433	88,509	55,197
Year	-	383,107	252,307	217,845	131,561
<b>Fish Solubles 4/:</b>					
Production:					
June	16,791	15,430	24,745	17,772	20,735
January-May 2/	17,574	27,395	26,762	22,428	16,211
Year	-	107,402	124,334	112,241	98,929
Imports:					
June	249	323	872	207	149
January-May	1,802	2,116	3,418	1,012	2,369
Year	-	6,773	6,308	6,739	3,174
(1,000 Lbs.) . . . . .					
<b>Fish Oils:</b>					
Production:					
June	40,230	28,193	54,924	49,686	35,907
January-May 2/	74,897	41,396	40,698	39,340	20,433
Year	-	185,827	250,075	258,118	209,143
Exports:					
June	117	255	4,921	21,035	15,629
January-May	56,139	97,806	58,084	47,092	37,191
Year	-	262,342	123,050	122,488	143,659

1/Preliminary.  
2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.  
3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.  
4/Includes homogenized fish.

\* \* \* \* \*

## U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-June 1964: Based on domestic production and imports, the United States available supply of fish meal for January-June 1964 amounted to 340,395 short tons--67,409 tons (or 24.7 percent) more than during January-June 1963. Domestic production was 7,086 tons (or 7.8 percent) less, but imports were 74,495 tons (or 40.9 percent) higher than in January-June 1963. Peru continued to lead other countries with shipments of 205,135 tons.

The United States supply of fish solubles (including homogenized fish) during January-June 1964 amounted to 36,416 tons--a decrease of 19.5 percent as compared with the same

Item	Jan.-June		Total 1963
	1/1964	1963	
. . . . (Short Tons) . . . .			
Imports:			
Canada . . . . .	30,015	23,328	50,925
Peru . . . . .	205,135	136,051	291,544
Chile . . . . .	10,036	16,798	24,249
Norway . . . . .	-	331	1,819
So. Africa Republic . . . . .	9,538	4,466	12,296
Other countries . . . . .	1,705	960	2,274
Total imports . . . . .	256,429	181,934	383,107
Available fish meal supply . . . . .	340,395	272,986	636,559
Fish Solubles:			
Domestic production . . . . .	34,365	242,825	210,740
Imports:			
Canada . . . . .	1,031	1,341	2,034
Iceland . . . . .	-	105	160
So. Africa Republic . . . . .	780	81	411
Other countries . . . . .	240	912	4,168
Total imports . . . . .	2,051	2,439	6,773
Available fish solubles supply . . . . .	36,416	45,264	114,175
1/Preliminary.			
2/50-percent solids. Includes production of homogenized condensed fish.			

1/Preliminary.  
2/50-percent solids. Includes production of homogenized condensed fish.

period in 1963. Domestic production and imports dropped 19.8 percent and 15.9 percent, respectively.



## Inventions

### FLOAT FOR FISHING LINE PATENTED:

The inventor of a float for fishing states that the device stays in the direction of the angler, loose on the line, allowing ease in casting and pulling. The float, which is equipped with a clamp, is loosely connected with the fishing line when the angler makes a cast. The float can be held in position by an adhesive which weakens upon contact with water. This allows the float to grip the line in an advantageous position on the surface of the water while the bait is always at the bottom, according to the inventor. (Patent No. 3,087,275, SIC No. 3949, granted Ernst Svoboda, Meiselstr. 65, Vienna 14, Austria.)



## Lobsters

### NEW TAGGING METHOD AIDS POPULATION STUDIES:

Success in permanently marking lobsters with internal tags has been reported by a University of Rhode Island oceanographer in the first phase of a study to learn more of the life and habits of the northern lobster.

The first known successful molt of an internally-tagged North Atlantic lobster took place July 15, 1964, in the lobster pound of a Rhode Island shellfish company when a lobster crawled out of its external skeleton still retaining a numbered,

U. S. Supply of Fish Meal and Solubles, January-June 1964 with Comparisons			
Item	Jan.-June		Total 1963
	1/1964	1963	
. . . (Short Tons) . . .			
<b>Fish Meal and Scrap:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	63,021	68,597	181,750
Tuna and mackerel . . . . .	8,466	10,369	26,957
Herring . . . . .	1,684	299	7,537
Other . . . . .	10,795	11,787	37,208
Total production . . . . .	83,966	91,052	253,452

(Table continued on next column.)

plastic-coated slug in its body. That development removes one of the major technical barriers to a study that could play a significant role in shaping lobster fishing legislation in the various States.

In recent years a disagreement has arisen involving the offshore lobstermen who fish with other trawls on the continental shelf and the inshore lobstermen who use baited traps or pots in shallower waters. In dispute is whether the inshore and offshore lobstermen are separate populations that should be controlled by different rules and standards or whether the offshore group is the major breeding stock for the entire population.

In planning studies to answer those and other questions, the new internal-tagging method for lobsters may represent a major breakthrough. Half-inch tags, weighing 0.16 grams or about 15 times less than a dime, are inserted behind the eye socket of lobsters, using a needle-sharp, stainless-steel, hollow plunger. Insertion takes only a matter of seconds and does not impair or affect a lobster's sight or other body functions. The cavity where the tag lodges has no "meat" and is not eaten by humans.

Since the tag contains a small amount of iron, it can be spotted by a very sensitive and sophisticated metal detector. For that purpose an electrical engineer has developed two opposing copper coils encased in a single plastic case which create a magnetic flux when energized. Shaped in the form of a hollow pipe about a foot long and a foot in diameter, the coils are hooked into an amplifier. The passage of a tagged lobster through the pipe creates a pulse which can be used to close a relay and activate a light, buzzer, or other warning signal.

With an investment of about \$5,000, it is thought that 10 additional and more compact detectors could be built and placed aboard commercial lobster vessels. Since lobsters have to be culled and handled individually to detect the presence of egg-bearing females, researchers believe it may be feasible to ask that commercial catches be funneled through a detector and that marked lobsters be put aside for further study.

In the past, scientists attempting to tag lobsters have used various external devices which are lost when the crustacean molts--about every year for adult males and every two years for adult females. The younger lobsters shed their skeletons even more frequently.

By tagging lobsters and returning them to their natural habitat to be caught by commercial fishermen, scientists hope to learn more about rates of growth, molting frequency, natural mortality rates, migratory patterns, and rates of harvesting--all on a long-term basis. In addition, the offshore catch is subject to seasonal variations. Do lobsters merely disperse over wide areas or do they travel to some other particular location? Such knowledge could be used to increase catches, and the new internal-tagging technique may help provide answers. The developer of the new tagging method has cautioned, however, that more research is needed on the long-term effects of the tags on lobsters. (University of Rhode Island, August 23, 1964.)



## Maine Sardines

### CANNED STOCKS, JULY 1, 1964:

Canners' stocks of Maine sardines on July 1, 1964, were 129,000 cases less than those on hand July 1, 1963, but were 140,000 cases above stocks on hand two years earlier on July 1, 1962 (the pack for the 1961 season was exceptionally small).

Carryover stocks at the canners' level amounted to about 622,000 cases on April 15, 1964, which is the traditional opening date of the Maine sardine packing season. Carryover stocks amounted to 660,000 cases on April 15, 1963, but only 33,000 cases on April 15, 1962, following the short-pack year.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1964, with Comparisons

Type	Unit	7/1/64	7/1/63	7/1/62
Distributors	actual cases	234,000	217,000	134,000
Canners	std. cases 1/	514,000	643,000	374,000

1/100 3 1/2-in. equal one standard case.

Sources: U. S. Bureau of the Census, *Estimates of Distributors' and Canners' Stocks* -- July 1, 1964.

During April 15-July 25, 1964, the Maine sardine pack totaled 315,750 standard cases, according to the Maine Sardine Council. That was much less than the 728,988 cases packed during the same period of 1963, but considerably larger than the 179,000 cases packed in the same period in 1961 when fishing was extremely poor.

In late July 1964, fishing conditions for Maine sardines were favorable and the pack was expected to improve during August.



## Marketing

### EDIBLE FISHERY PRODUCTS, JANUARY-JUNE 1964:

Supplies of edible fishery products during the first 6 months of 1964 were larger than in the same period a year earlier. United States holdings of fishery products in cold-storage at the beginning of the year, together with increased fishery products imports, more than offset the lower fishery landings of the first 6 months in 1964. With retail prices somewhat lower than in the corresponding period a year earlier, the domestic consumption of fishery products rose slightly.

At midyear, stocks of edible frozen fishery products were about 5 percent lower than for



Retailers waiting for their purchases in loading area in the salt-water section of New York City's Fulton Fish Market.

the same period a year earlier. Cold-storage holdings of fish sticks and portions, halibut and cod fillets, and steaks were down considerably. But stocks of haddock fillets, crabs (including crab meat), and raw headless shrimp were larger than on June 30, 1963.

United States consumption of fishery products will likely continue above a year earlier throughout the summer and fall months. Although present conditions point to lower domestic fishery landings of some major species--scallops, halibut, and ocean perch, in particular--increasing imports are likely to more than compensate for the decline. Marked increases over 1963 are anticipated in the 1964 United States imports of tuna, scallops, ocean perch, and cod fillets.

Retail prices for the balance of 1964, it is believed, will continue at least as favorable for consumers as last year. The retail food price index for fishery products is expected to average slightly below a year earlier during the latter half of this year. Some slight seasonal increase in prices may be expected toward the end of the year.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in U. S. Department of Agriculture's August 1964 issue of the National Food Situation (NFS-109).



## North Atlantic Fisheries Investigations

### BLACKBACK FLOUNDER STUDIES AIDED BY DISCOVERY OF DISTINCTIVE GROUP ON GEORGES BANK:

Blackback flounder do not usually migrate great distances as many tagging experiments have shown. How little they move about even on offshore fishing banks was recently indicated when one small area on Georges Bank was discovered to harbor a substantial percentage of abnormally pigmented blackbacks. When it turned out that almost all were exactly the same age, 5 years, it was even more apparent that the fish tend to stay in one place. Current opinion is that color abnormalities are the result of external factors and are not genetic. Oceanographic data for 1959 are being carefully examined for clues that may help explain the unusual markings. The location of the isolated and distinctive group of fish is considered a timely discovery by the U. S. Bureau of Commercial Fisheries Woods Hole (Mass.) Bio-

logical Laboratory which is attempting to determine the origin of blackbacks on Georges Bank.

Note: See Commercial Fisheries Review, August 1964 p. 34.



## North Pacific Exploratory Fishery Program

### HAKE DISTRIBUTION STUDY:

M/V "John N. Cobb" Cruise 67 (August 10-October 9, 1964): To study hake resources off the Washington, Oregon, and northern California coasts in depths from 35 to 100 fathoms was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel John N. Cobb which left Seattle, August 10, 1964, for 8 weeks of exploratory fishing.



John N. Cobb, U. S. Bureau of Commercial Fisheries exploratory fishing vessel, this past summer was studying the hake resources off Washington, Oregon, and northern California.

The main objective of the cruise was to investigate the bathymetric and geographic distributions of the hake populations from Cape Flattery, Wash., to northern California. Secondary objectives were to attempt to assess the magnitude of the hake resources in those waters, and to collect pertinent data on the environmental factors influencing the distribution and abundance patterns.

The method of operation included echosounding transects to locate concentrations of hake, and the use of various trawls to sample the density of the hake population when located.

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### PELAGIC TRAWL DEVELOPMENT PROGRAM:

M/V "St. Michael" Cruise 3: To evaluate and modify a newly-designed multipurpose pelagic trawl having very long wings in a configuration similar to a lampara seine was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries chartered gear research vessel St. Michael.

The vessel left Seattle, Wash., on August 17, 1964, for 4 weeks of operations in bay and coastal waters. The cruise plan called for underwater and surface observations and measurements of the new trawl which is to be developed for off-bottom, midwater, and surface fishing. Actual fishing trials of the net will be conducted during subsequent cruises.



### Oceanography

#### GULF OF GUINEA INVESTIGATIONS BY RESEARCH VESSEL "GERONIMO":

M/V "Geronimo" Cruise 4 (July 10-November 4, 1964): To continue oceanographic studies in the Gulf of Guinea is the purpose of this 118-day cruise by the research vessel Geronimo, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C. The studies to be undertaken on this cruise will be along the same lines as those conducted during Geronimo cruise 3 (January 15-May 15, 1964), when she participated in EQUALANT III of the International Cooperative Investigations of the Tropical Atlantic (ICITA).

Cruise 4 started on July 10, 1964, when the vessel departed Norfolk, Va., with Dakar, Senegal, scheduled as the first port of call on July 27. The vessel's operational schedule lists Abidjan, Ivory Coast, as the last port of call on October 14, and return thereafter to the United States with arrival at Washington, D. C., on November 4, 1964.

The objectives of this cruise are:

1. Extension of the current measurement program in conjunction with biological and environmental studies in the Gulf of Guinea.
2. Surveys of the distribution of schools of tuna in surface waters of the Gulf of Guinea and of related environmental parameters.

3. Field training for staff technicians and personnel detached from other activities.

4. Evaluation of new analytical instruments and various anti-oxidants as stabilizers of biological color in preserved plankton studies.

#### Schedule of Observations:

##### 1. Norfolk, Va., to Dakar (July 10-27):

- a. Equipment shakedown station will be occupied in 1,000 fathoms of water east of Cape Henry. Work will include bathythermograph (BT) cast, 18 bottle hydrographic cast to 1,000 meters, current meter observation, Neuston net haul, Clarke Bumpus haul.
- b. A BT cast and surface salinity sample every 3 hours. An ASWEPS BT message will be transmitted every 6 hours.
- c. Weather observations every 6 hours, at 0000, 0600, 1200, 1800 GMT. All messages will be transmitted as synoptically as practicable.
- d. While under way and during daylight hours, a record will be maintained of the occurrence of fish schools, birds, and mammals observed at the sea surface.
- e. A productivity station will be made at local noon daily. Measurements will be made at depths of 100, 50, 25, 10, 1 percent of incident solar radiation. Phosphate and salinity samples will be analyzed at each depth sampled.
- f. A 30-minute surface plankton tow with a one-meter net to be made each midnight.
- g. A 15-minute Neuston haul to be made just preceding the productivity station at LAN and each midnight following the meter-net haul.
- h. A two-hour nightlight station following the plankton tows each midnight while in the Sargasso Sea.

##### 2. Dakar, Senegal, to Lagos, Nigeria--Tuna Survey I (July 30-August 25):

- a. Baiting: Search for suitable bait will begin in the evening off the coast of Senegal. Local sources of bait information will be utilized. After adequate bait supplies have been obtained, a 12-hour "settling down" period will be allowed before proceeding to survey area. If bait is not found the search will be continued off the coast of Sierra Leone. Surface water temperature and salinity observations will be made wherever bait is obtained.
- b. Tuna surveys: These surveys will be conducted during daylight hours, about 0600-1800 each day. The search will follow an "in-out" pattern with lines extending south

from the 100-fathom curve for a distance of about 90 miles, the transects beginning at 7°30' west longitude, being spaced at 30-minute intervals and terminating at 3°30' east. If bait is completely unavailable, survey transects will be run using either jigs or long line gear.

Samples of tuna from a maximum number of schools are desired. Pole-and-line fishing will be attempted on each school encountered. Jigs will be trolled continuously during the tuna surveys. If the fish bite, fishing will be broken off after 25 fish of each species in the school are aboard. If the fish do not come up to the vessel and start biting after 2 passes, chumming will be broken off and the survey resumed. It is not known at what point in the survey that the initial supply of live bait may become exhausted. In the event that this does occur, an attempt will be made to replenish the supply of bait, after which the survey will be resumed.

Observations to be made upon successful sampling of tuna schools will include:

- (a) Fork length, sex, weight.
- (b) Preserve 10 ovaries from among the 25 caught from each school sampled.
- (c) Preserve stomach samples from each of the 25 caught from each school.

Supplemental observations during the tuna surveys:

- (1) 0500-0600 BT and Nansen bottle cast.
- (2) BT's every hour and at each fishing station.
- (3) Productivity station, hydrographic cast and meter-net haul at local noon daily.
- (4) BT cast, Nansen bottle cast, and meter net haul 1800-1900 daily.
- (5) Weather observations every 6 hours.
- (6) At midnight a  $\frac{1}{2}$ -hour meter-net haul at the surface.
- (7) After the meter-net haul, two 15-minute hauls with the Neuston net.
- (8) A two-hour nightlight station following the net tows.
- (9) Bathymetry. The EDO will be operated at all times while under way. A time-reference notation will be made on the fathogram every half hour.

### 3. Lagos to Freetown, Sierra Leone (August 28-September 17):

a. A total of 30 stations will be occupied:

- (1) BT casts before and after Nansen bottle casts.
- (2) 18-bottle hydrographic cast to 1,000 meters.

(3) At 13 of the hydrographic stations a current meter will be lowered from the vessel to 500 meters using an anchored buoy as a reference.

(4) A one-half hour meter-net haul at the surface.

(5) A 15-minute Neuston haul.

b. Between stations, BT casts and surface salinity samples every hour.

(1) Weather observations every 6 hours.

(2) A productivity station daily at local apparent noon.

(3) Bathymetry observations throughout.

(4) Nightlighting as opportunity affords.

(5) A transect of 6 depth Clarke Bumpus hauls crossing the equator on a line between 3° N. and 3° S.

(6) A 24-hour Clarke Bumpus station will be occupied at a suitable location in equatorial waters. C-B hauls at 6 depths will alternate with BT casts throughout the period.

c. Additional shallow drogue observations will be carried out as required to properly implement the current meter observations.

### 4. Freetown to Abidjan (September 20-October 16):

Tuna Survey II will be a repeat of Tuna Survey I.

### 5. Abidjan to Washington, D. C. (October 16-November 4):

The same observational schedule will be followed as during passage from Washington, D. C., to Dakar.

Note: See Commercial Fisheries Review, July 1964 p. 24; April 1964 p. 46.

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### NEW OCEANOGRAPHIC RESEARCH VESSELS LAUNCHED BY U. S. NAVY:

The oceanographic research vessel Thomas G. Thompson (AGOR-9) was launched July 18, 1964, at Marinette, Wis., by the U. S. Navy. The vessel is designed to be a floating laboratory to be used in support of the National Oceanographic Research Program. It will be operated by the University of Washington. The new vessel is 209 feet in overall length and displaces 1,370 tons.

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The USNS Silas Bent was launched May 16, 1964, as the first of a series of five intermediate-sized oceanographic vessels for the U. S. Navy. The Silas Bent was designed primarily to do surveying work programmed by the United States Naval Oceanographic Office



in both Arctic and tropical waters. The fore-section of the vessel is sufficiently ice-strengthened to navigate Arctic waters and the vessel is air-conditioned throughout. The principal dimensions of the vessel are: length overall 285 feet; beam, maximum moulded, 48 feet; depth, moulded to main deck, 23½ feet; and displacement, full load, 2,550 long tons. Accommodations are provided for 12 officers, 32 crewmen, and 34 scientists.

The Silas Bent is powered by a single-screw Diesel-electric propulsion system, providing a sustained service speed of 15 knots, and an endurance of 12,000 miles at 12 knots. The principal machinery consists of two 1,260 kw. Diesel generators coupled to a single shaft through a 3,000-hp. motor. The vessel also has a trainable and retractable bow propulsion unit that is capable of moving or maintaining the vessel's position in any desired direction while it is engaged in oceanographic operations.



Launching of the Silas Bent at Loraine, Ohio.

Other features include a 15,000-pound hydraulic anchor windlass, 12 electric winches for handling scientific equipment, and an articulated crane with a 2,500-pound capacity at a radial outreach of 57 feet.

The Silas Bent has been named in honor of a United States Naval officer who was a pioneer in oceanographic work. As a lieutenant, Silas Bent (1820-1887) was active in survey work and served under Commodore Matthew Perry on expeditions to Japan.

In charge of hydrographic surveying on these expeditions, Lieutenant Bent's most significant achievement was to establish the delineation and description of the Kuro Siwo or Black Tide, the great northward-flowing

stream in the Pacific Ocean, comparable to the Gulf Stream in the North Atlantic.

The Silas Bent is scheduled for completion by July 1965. The vessel will be under the operational control of the Military Sea Transportation Service and under the technical control of the Naval Oceanographic Office. (Sea-lift Magazine, August 1964.)



## Oregon

### SALMON ESCAPEMENT AIDED BY BRIEF INDUSTRIAL PLANT SHUTDOWN AT WILLAMETTE FALLS:

A 3-hour shutdown of operations at 2 industrial plants at Willamette Falls, Oreg., on June 18, 1964, resulted in the escapement of a substantial number of adult spring chinook salmon that had been trapped in a cul-de-sac on the west side of the river. An Oregon Fish Commission biologist reported that 841 chinook successfully negotiated the fish ladder at the Falls following the shutdown on that day as contrasted with only 39 fish passing the previous day. The fishery scientist commended the industries for their cooperation in the conservation effort. He said the companies involved have agreed to the temporary shutdown each season for many years despite the considerable cost to them.

The cul-de-sac is a deep pocket or cove located on the west side of the river just below the falls. It has long been a problem area since water flowing into the pocket from industrial operations at the site creates a current which attracts upstream migrating fish. Many of the fish that are drawn there mill about endlessly, apparently unwilling to leave the attractive current flowing from the industrial plants.

Shutting down the plants for a period of time eliminates the cul-de-sac attraction thus encouraging the fish to move out of the blind alley. Much of the water that normally flows through the plants and into the cul-de-sac is diverted to the fish ladder or over the falls in the immediate vicinity of the ladder during a shutdown. This creates a stronger than usual attraction flow that enables the fish to much more readily locate the entrance to the passage facility.

A tabulation of this season's spring chinook run showed that 36,370 chinook had pass-

ed over the ladder at Willamette Falls by late June 1964. During the same period, the sport chinook catch in the Willamette, from the mouth of the Falls, and in the lower Clackamas River totaled about 18,600 fish. The total Willamette-Clackamas spring chinook run was about 58,000 fish, including 3,000 escapement tabulated on the Clackamas River. The average run for the past 17 years has been 50,000 spring chinook. (Oregon Fish Commission, June 22, 1964.)

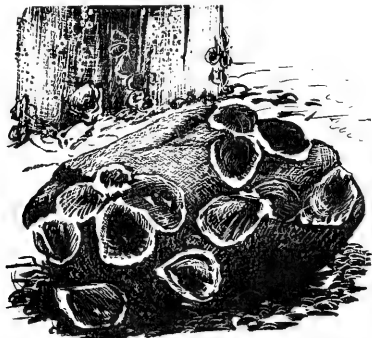


## Oysters

### MARYLAND OBSERVATIONS FOR 1964:

Information on oyster growth and related data will again be issued this year in a series of reports by the Chesapeake Biological Laboratory (Solomons, Md.) of the University of Maryland Natural Resources Institute. Information on spatfall, fouling of shells, oyster growth and condition, oyster mortality, hydrographic conditions, and general biological information will be included. Following are excerpts from Bulletin No. 1 of July 23, 1964:

**The 1964 Spatfall:** The program of continuous spatfall monitoring has been somewhat modified this year to increase its efficiency. With the cooperation and assistance of the Department of Chesapeake Bay Affairs, the Biological Laboratory is making weekly collections of test cultch from selected actual or potential seed areas. Whereas in the past 25 test shells in a chicken wire bag have been used as cultch, this year the



Oyster spat (magnified many times) on small pebble.

shells have been replaced by  $4\frac{3}{4}$ -inch square plates of an asbestos composition board. Two plates of that kind are exposed in specially-designed wooden holders hung just above the bottom at each station. Previous tests have shown that the plates are attractive to the same organisms as oyster shells.

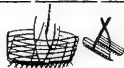
Each week the holders are changed and the plates are brought to the Laboratory and examined under a microscope. Spat, as well as barnacles, blisters, and other associated fouling organisms are counted, and tallied in a systematic manner, thus showing when the potential set reaches a peak in any given area. With the use of the plates, it is possible to count spat faster and with more accuracy than before. Investigations have the additional advantage of examining a precisely known area of cultch.

Setting began late this spring, since the water temperature took longer than usual to reach the sustained high level required for spawning. As of late July 1964, the set had not reached the level of last season.

**The 1963 Spatfall:** The 1963 spatfall was well above average in both intensity and range, and proved to be the best general set in over 15 years. Most of the shell plantings were highly successful and the seed areas produced valuable seed. A few areas, such as Holland Straits, were spotty and irregular. The St. Marys River and the Wicomico tributary of the Potomac River were both high producing areas. Parts of Eastern Bay, Harris Creek, Broad Creek, the Little Choptank River, and Kedges Straits also exhibited high counts, as did the Honga River. In the Potomac River, the Jones Shore-Cornfield area was the site of the highest set. Further up the Bay, even the South River had a good strike, most of which caught on mussel shells.

Notes: (1) For more detailed data write to the Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. ("Report of Maryland Oyster Observations for 1964," Bulletin No. 1, July 23, 1964.)

(2) See *Commercial Fisheries Review*, Feb. 1964 p. 33.



## Radiation Preservation

### PACKAGING REQUIREMENTS FOR IRRADIATED PRODUCTS:

A major consideration in using radiation to preserve fishery products is a selection of suitable packaging materials in which the product can be irradiated and marketed. Such

materials must be nontoxic, must not be affected by irradiation, and must protect the product from oxidation and bacterial contamination. In addition, the materials should be relatively strong so that they will withstand moderate to severe handling, must be easily and effectively sealed and despite rough handling must retain an effective seal, should be inexpensive, and should be lightweight to minimize shipping costs.

In view of those requirements, tests on various types of plastic films are being conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass. Eight plastic films have been investigated. The results indicate that 4 of the films--nylon 11, "saran" (coated nylon 11), and 2 different polyolefin films (coated polyesters)--are suitable in that they meet the requirements described above.

Three films--polyethylene, polypropylene, and nylon 6--were found to be poor oxygen barriers. Those films allowed increased bacterial multiplication during storage. That was probably due to oxygen permeability. Cellophane was found to be a good oxygen barrier, but had poor sealing characteristics.

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#### MASSACHUSETTS FISHERY PRODUCTS IRRADIATOR NEAR COMPLETION:

The Marine Products Development Irradiator being built adjacent to the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., is expected to be ready for dedication about the end of September. The facility will be operated as part of the research and development program conducted in cooperation with the Atomic Energy Commission (AEC) by the Bureau's Technological Laboratory at Gloucester. When completed, the plant is expected to operate on a near-commercial scale, processing marine products at a rate of up to one ton an hour using a 250,000-curie cobalt-60 radiation source.

The plant will be the second largest cobalt-60 food irradiator in the world with special operating features enabling it to have a production greater than any food irradiator in operation elsewhere--or any known to be in the planning stage. The largest is the U. S. Army's irradiator at Natick, Mass.

The fishery products irradiator is being built to demonstrate the feasibility of ex-

tending the refrigerated storage life of fresh fishery products as a part of the AEC radiation-pasteurized food program.

The Bureau's Gloucester Laboratory has been developing plans for consumer acceptance tests of irradiated fishery products.

Note: See Commercial Fisheries Review, September 1963 p. 33.



## Salmon

### MARKING PROGRAM ON THE COLUMBIA RIVER REVEALS MIGRATION PATTERNS:

Significant information on the Pacific migrating habits of Columbia River salmon is being obtained by "Operation Fin Clip," the gigantic fish-marking program of the U. S. Bureau of Commercial Fisheries. Cooperating State and Canadian fishery agencies report that large numbers of the marked fish have been taken by commercial and sport fishermen in the North Pacific.

"Operation Fin Clip," is designed to determine the contribution made by Columbia River hatcheries to the commercial and sport catch of fall chinook salmon. It involves the marking of approximately 32 million fish over a 4-year period. The Bureau of Commercial Fisheries, which provides about \$2 million a year for the operation and maintenance of 22 State and Federal hatcheries on the Columbia River and its tributaries, wants to find out how much they contribute to the total fish catch in order to decide whether it should continue spending money on them.

A summary of the program to mid-1964 showed that a total of 2,223 three-year olds had been recovered from the first 7.5 million marked baby salmon which were released into the River in 1962. The heaviest recoveries were made off the west coast of Vancouver Island, British Columbia. Large concentrations of marked fish were also recaptured off the Oregon and Washington coasts, while relatively small returns were noted in California and Alaskan waters. State and Canadian agencies have stationed trained observers at key spots to tabulate the marked fish as they are brought in by sport and commercial fishermen.

The Bureau of Commercial Fisheries plans to expand the program this year by placing recovery crews on all tributaries of the Columbia below the fish hatcheries. In addition,

efforts will be made to sample Indian catches for marked fish. The crews expected to begin their surveys late in the summer of 1964 when fall chinook start returning from the ocean and begin running upstream to spawn. Other streams also will be surveyed to find out whether there is any straying by the hatchery-bred chinooks from the streams where they were spawned.

To assess sport fishing intensity, an aerial observer in a chartered plane will aid in counting the number of sport fishermen on the main Columbia River between the Dalles Dam and Tongue Point near the mouth of the River. There will also be a pole-count of fishermen on the ground as well as a postal-card survey.

Reports in early August 1964 indicated that hatchery-marked fall chinook salmon had begun entering the Columbia River.

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#### **NORTH PACIFIC MIGRATION STUDY OFF WESTERN ALEUTIANS:**

In a continuing study on high-seas salmon distribution and abundance in the North Pacific, the U. S. Bureau of Commercial Fisheries research vessel *George B. Kelez* left Seattle in late August 1964 for a 2-months cruise off the western Aleutian Islands. The main objectives of the cruise are: (1) to determine the western extent and migration routes of immature salmon known to pass through the central Aleutian area each summer; (2) to compare catch rates and selection qualities of surface gill nets and floating long lines; and (3) to test two sound (sonar) systems for detecting salmon. Salmon specimens taken during the cruise will also provide data for studies on the continental origin of North Pacific salmon.

Primary interest during this cruise will center on the area between longitudes 175° E. to 165° E. (Attu Island to Komandorski Island) and between latitudes 50° N. and 54° N. This marks the first attempt of United States research vessels to determine distributional patterns and migration routes of salmon in the central Aleutian area in the late summer and early fall seasons.

## **School Lunch Program**

### **NATIONAL SCHOOL LUNCH WEEK:**

The week of October 11-17 was set aside as National School Lunch Week by Presidential proclamation. Providing a lunch for 17 million youngsters every school day requires a tremendous amount of food. Last year the food bill totaled \$876 million. Approximately \$688 million of that amount was spent in local food markets.



School-lunch cafeteria serving fish.

For the year ending July 1963, school-lunch purchases of fishery products amounted to 44.9 million pounds valued at \$21.8 million, according to the U. S. Department of Agriculture.



## **Shellfish**

### **FIFTH NATIONAL SHELLFISH SANITATION WORKSHOP TO BE HELD:**

The U. S. Public Health Service will hold the fifth National Shellfish Sanitation Workshop November 17-19, 1964, in Washington, D. C. The meeting will bring together members of industry and Government officials who are concerned with shellfish sanitation.

The Workshop will open with a program status report by the Director of the Oyster Institute of North America and a report by a representative of the U. S. Public Health Service. Subjects to be presented and discussed at the Workshop include depuration (cleansing), advances in shellfish culture, imports, bacteriological standards, the use of chemicals on or near shellfish growing areas, a study of a hot dip process, and pro-



posed changes in Parts I, II, and III of the Shellfish Sanitation Manual. The Workshop will conclude with a status report on shellfish sanitation research centers.

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#### NORTH PACIFIC INDUSTRY AFFECTED BY RECENT DISASTERS:

The West Coast shellfish industry was affected by 2 recent disasters -- 1 natural and the other manmade. Damage to 2 Washington State commercial oyster beds as a result of the tidal wave following the Alaskan earthquake is reported to be over \$400,000. Substantial oyster seed plantings in California waters a few weeks prior to the quake were also reported swept away by the tidal action.

The Washington State razor clam industry was adversely affected when a fuel barge loaded with 56,000 barrels of Diesel oil and gasoline ran aground at Moclips, Wash., March 12, 1964, during a coastal storm. Fuel oil leakage destroyed the entire razor clam population along an 8- to 10-mile strip of beach.

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#### MAINE CONDUCTS RESEARCH ON SANITATION:

An \$11,988 research contract on shellfish depuration (cleansing) has been negotiated between the U. S. Public Health Service and the Maine Department of Sea and Shore Fisheries. The contract extends from April 15, 1964, through April 14, 1965, with research to be performed at Boothbay Harbor and Biddeford Pool, Maine. Studies of the flow rate to determine the optimum water flow for depuration of soft clams; the keeping quality of shellfish that have undergone depuration; and salinity acclimatization and its influence on shellfish depuration are some of the projects that will be undertaken.

The Maine Department of Sea and Shore Fisheries has also announced approval of the construction of the first commercially- and privately-operated clam depuration plant in Maine.

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#### RECLAMATION PROJECT IN NEW YORK STATE:

The New York Legislature has appropriated a \$50,000 revolving fund to the State

Conservation Department for the purpose of reclaiming shellfish from closed shellfish areas. Initial harvesting operations were begun in Flanders Bay (east end of Long Island) on May 11, 1964, and by July 1964 some 6,000 bushels of clams had been harvested and sold to various Long Island townships for redistribution. The Marine Fisheries Sanitarian in the New York Conservation Department stated that the project has been highly successful and that township officials welcome this means of increasing their shellfish resources.

In related action, the New York Legislature increased penalties for persons taking shellfish from condemned areas. Maximum fines are now \$1,500 and confiscation of equipment and/or 1 year imprisonment.



## Shrimp

### UNITED STATES SHRIMP SUPPLY INDICATORS, JULY 1964:

Item and Period	1964	1963	1962	1961	1960
	. . . (1,000 Lbs, Heads-Off) . . .				
<b>Total landings, So. Atl. and Gulf States:</b>					
September	-	18,045	13,012	9,691	18,832
August	-	19,769	12,340	10,944	20,441
July	15,000	16,291	12,394	10,900	21,746
June	11,197	13,134	11,309	8,233	12,427
January-May	27,790	26,249	20,838	22,797	24,348
January-December	-	138,254	105,839	91,395	141,035
<b>Quantity canned, Gulf States 1/:</b>					
September	-	3,697	1,759	598	2,222
August	-	5,121	1,355	1,090	4,427
July	2,080	3,726	3,551	2,793	5,802
June	4,170	5,234	4,913	3,438	6,920
January-May	1,834	4,778	2,625	1,525	2,114
January-December	-	29,468	23,322	14,500	26,394
<b>Frozen inventories (as of end of each mo.) 2/:</b>					
September 30	-	27,356	12,843	13,361	24,492
August 31	-	24,803	12,754	12,728	20,171
July 31	-	25,460	13,677	14,849	17,397
June 30	25,546	24,047	13,796	19,416	15,338
May 31	28,082	24,053	13,904	24,696	17,540
April 30	28,254	24,954	15,637	27,492	20,502
March 31	31,428	27,970	16,607	31,345	23,232
<b>Imports 3/:</b>					
September	-	10,236	9,696	8,629	8,190
August	-	8,598	7,381	6,743	6,407
July	-	11,002	8,265	6,635	7,319
June	10,528	9,439	9,397	8,063	8,932
January-May	60,274	61,046	54,403	45,103	42,433
January-December	-	151,530	141,103	126,268	113,418
<b>Ex-vessel price, all species, So. Atl. and Gulf Ports:</b>					
September	-	57.9	90.9	70.1	52.2
August	-	59.0	83.6	66.1	52.0
July	4/58-69	63.5	82.1	55.8	54.6
June	4/60-72	77.0	84.4	53.7	64.1
May	4/59-69	80.9	83.7	52.8	62.9
April	4/57-61	83.6	82.2	55.4	60.6
March	59.6	85.5	80.9	56.0	56.3

(Table continued on next page.)

Item and Period	1964	1963	1962	1961	1960
. (¢/lb., 26-30 Count, Heads-Off). .					
Wholesale price, froz. brown (5 lb. pkg.), Chicago, Ill.					
September	-	75-77	113-118	87-90	65-70
August	-	75-81	110-112	76-91	64-67
July	80-85	77-97	-	70-75	72-77
June	80-85	95-102	102-104	67-72	76-77
May	72-83	100-103	96-103	67-69	74-77
April	72-74	100-105	94-97	69-70	74-75
March	72-75	102-105	94-95	69-71	65-68

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.  
 2/Raw headless only; excludes breaded, peeled and deveined, etc.  
 3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.  
 4/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Tex., only.  
 Note: July 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fisheries Market News Service. To convert shrimp to head-on weight multiply by 1.66.



## Trout

### RAINBOW TROUT EGGS FROM AUSTRALIA HELP EXPAND IDAHO FISH FARM PRODUCTION:

A large United States commercial trout farm in Idaho imported 500,000 rainbow trout eggs from Australia in 1963 to provide new stock during that period of the year when native American rainbow trout are not spawning.

An Australian consignment of 150,000 eggs and another of 117,000 eggs arrived in excellent condition from the Victorian Fisheries and Wildlife Department, and the hatching and survival rate was as high as 90 percent. However, there was a 50-percent mortality rate in the third shipment of 233,000 eggs in October 1963. The losses were caused by the heat and early hatching resulting from a 3-day delay in transit.

The trout hatched from the Australian eggs were reared under the advanced methods developed by the owner of the Idaho farm. The 90 ponds at the farm are fed with flowing water by an extensive underground lake which gushes 250,000 gallons a minute at a temperature of 58° F. all year. Trout at the farm reach market size about a year after hatching. They are fed a diet of fish meal, yeast, whey, soybeans, and alfalfa. The trout are said to grow an inch a month on that diet. Biologists at the farm regularly take blood tests and samples to see that the fish are free of disease and growing properly. After harvesting, the trout are processed by an eviscerating machine capable of cleaning

1,000 fish an hour. The farm also markets live trout.

New breeding methods have been developed at the farm. A stock of rainbow trout has been developed which spawn at the age of 2 years rather than 3 years, and the spawning period is said to have been expanded from 3 to 9 months. The resources of the farm should be further expanded by the addition of the Australian trout. The farm has also developed a special strain of trout--a mutation--and has engaged a computer specialist to assess the prospects of line breeding the new strain. (Australian Fisheries Newsletter, May 1964.)

Note: See Commercial Fisheries Review, Aug. 1964 p. 40.



## United States Fisheries

### COMMERCIAL FISHERY LANDINGS, JANUARY-JULY 1964:

The United States catch of fish and shellfish in 1964, mostly for the first 7 months (in some instances various periods through August 9), was down about 42 million pounds as compared with the same period in 1963. The decline



Fig. 1 - Baiting a lobster pot aboard a New England lobster boat.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1964 and 1963				
Species	Period	1/1964	1963	Total 1963
..... (1,000 Lbs.) .....				
Anchovies, Calif. 2/	6 mos.	1,500	2,062	3,774
Cod:				
Maine .....	6 mos.	1,400	1,262	1,960
Mass. 3/ .....	7 "	15,700	19,794	31,475
Total cod .....		17,100	21,056	33,435
Flounder:				
Maine .....	6 mos.	700	811	1,216
Mass. ....	7 "	51,600	52,142	91,876
Total flounder .....		52,300	52,953	93,092
Haddock:				
Maine .....	6 mos.	1,300	1,146	2,878
Mass. 3/ .....	7 "	78,300	70,606	106,075
Total haddock .....		79,600	71,752	108,953
Halibut: 4/				
Alaska .....	7 mos.	12,700	17,956	22,372
Wash. & Oreg. ....	7 "	6,200	8,268	11,871
Total halibut .....		18,900	26,224	34,243
Herring, Maine .....	6 mos.	10,200	25,108	152,317
Industrial fish, (Me. & Mass.) 5/ .....	6 mos.	14,700	19,035	47,897
Mackerel:				
Jack 2/ .....	6 mos.	35,100	42,932	98,078
Pacific 2/ .....	6 "	4,200	15,196	36,974
Menhaden .....	7 mos.	924,500	965,208	1,779,500
Ocean perch:				
Maine .....	6 mos.	22,600	30,116	63,905
Mass. ....	7 "	18,100	28,954	44,387
Total ocean perch .....		40,700	59,070	108,292
Pollock (Me. & Mass.) 3/ .....		6,200	6,726	13,216
Salmon, Alaska to August 9		217,400	171,054	208,000
Scallops, sea, New Bedford (meats) .....	7 mos.	8,100	9,791	15,941
Shrimp (heads-on), So. Atl. & Gulf .....	7 mos.	84,800	88,522	219,900
Squid, Calif. 2/ .....	6 mos.	5,700	6,676	7,942
Tuna, Calif. ... to August 8		177,300	150,022	285,285
Whiting:				
Maine .....	6 mos.	4,900	4,169	15,942
Mass. ....	7 "	23,717	34,547	64,571
Total whiting .....		28,617	38,716	80,513
Total all above items .....		1,726,917	1,772,103	3,327,352
Other 6/ .....		249,983	247,224	1,422,793
Grand total .....		1,976,900	2,019,327	4,750,145

1/ Preliminary.  
 2/ Cannery receipts.  
 3/ Landed weight.  
 4/ Dressed weight.  
 5/ Excludes menhaden.  
 6/ Includes landings for species not listed.  
 Note: Fishish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

occurred principally in landings of menhaden, ocean perch, Maine herring, jack and Pacific mackerel, and whiting. As of August 21, the New England whiting catch was up sharply. Menhaden landings to July 31, 1964, totaled 924.5 million pounds—a drop of 40 million pounds as compared with the same period in 1963. The decline in menhaden landings was limited to the Middle Atlantic area where the catch was only one-third as large as in the same period the previous year.



Fig. 2 - At Gloucester, Mass., a small dragger unloading iced ocean perch into a truck.

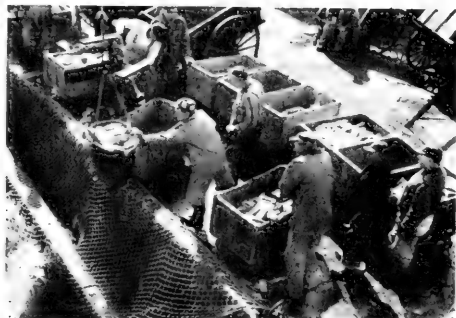


Fig. 3 - Unloading haddock from a trawler at Boston Fish Pier.

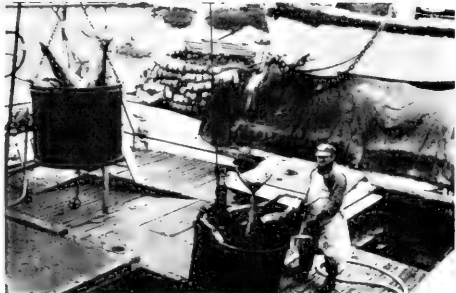


Fig. 4 - Unloading tuna at a southern California dock.

Increased landings were reported principally for salmon in Alaska, tuna, and haddock. On the basis of the reported pack of canned salmon and fresh salmon sales to Japanese freezerships, it was estimated that the catch of salmon to August 9, 1964, totaled 217 million pounds—a gain of 46 million pounds as compared with the same period in 1963.

\* \* \* \* \*

# FISH STICKS AND PORTIONS PRODUCTION, APRIL-JUNE 1964:

United States production of fish sticks and fish portions amounted to 39.9 million pounds during the second quarter of 1964, according to preliminary data. Compared with the same quarter of 1963, this was a decrease of 2.5 million pounds or 5.9 percent. Fish portions (24.5 million pounds)

Table 1 - U.S. Production of Fish Sticks by Months and Type, April-June 1964 1/

Month	Cooked	Raw	Total
	... (1,000 Lbs.) ...		
April	5,547	394	5,941
May	5,025	397	5,422
June	3,642	451	4,093
Total 2nd Qtr. 1964 1/	14,214	1,242	115,456
Total 2nd Qtr. 1963	17,446	975	18,421
Total 1st 6 months 1964 1/	33,940	2,766	36,706
Total 1st 6 months 1963	40,129	2,140	42,269
Total Jan.-Dec. 1963	74,132	5,163	79,295

1/ Preliminary.

Table 2 - U.S. Production of Fish Sticks by Areas, April-June 1964 and 1963

Area	1/ 1964		2/ 1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	11,292	22	15,227
Inland & Gulf States	5	2,365	7	1,997
Pacific Coast States	12	1,799	10	1,197
Total	39	15,456	39	18,421

1/ Preliminary.

2/ Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1960-64

Month	1/1964	2/1963	1962	1961	1960
	... (1,000 Lbs.) ...				
January	7,226	7,554	6,082	6,081	5,511
February	7,061	8,241	6,886	7,097	6,542
March	6,963	8,053	7,658	7,233	7,844
April	5,941	6,546	5,719	5,599	4,871
May	5,422	5,750	5,643	5,129	3,707
June	4,093	6,125	5,117	4,928	4,369
July	-	4,870	3,740	3,575	3,691
August	-	5,696	5,760	6,927	5,013
September	-	5,865	6,582	5,206	5,424
October	-	8,128	6,698	6,133	6,560
November	-	6,471	6,305	6,288	6,281
December	-	5,996	6,027	5,618	5,329
Total	-	79,295	72,217	69,824	65,142

1/ Preliminary.

2/ Revised.

Table 4 - U.S. Production of Fish Portions by Areas, April-June 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	21	15,573	23	14,182
Inland & Gulf States	6	8,257	10	9,021
Pacific Coast States	9	627	9	783
Total	36	24,457	42	23,986

1/ Preliminary.

2/ Revised.

Table 5 - U.S. Production of Fish Portions by Months and Type, April-June 1964 1/

Month	Breaded			Un- breaded	Total
	Cooked	Raw	Total		
	. . . (1,000 Lbs.). . .				
April	1,917	6,054	7,971	93	8,064
May	1,808	6,162	7,970	166	8,136
June	1,374	6,739	8,113	144	8,257
Total 2nd Qtr. 1964 1/	5,099	18,955	24,054	403	24,457
Total 2nd Qtr. 1963	4,081	19,266	23,347	639	23,986
Total 1st 6 mos. 1964 1/	10,485	38,220	48,705	1,259	49,964
Total 1st 6 mos. 1963	8,220	38,682	46,902	1,453	48,355
Total Jan-Dec. 1963	16,623	74,970	91,593	3,054	94,647
1/ Preliminary.					

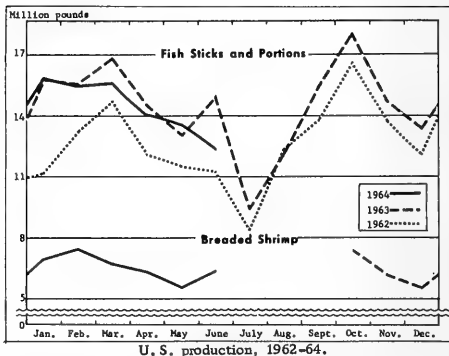
1/ Preliminary.

Table 6 - U.S. Production of Fish Portions by Months, 1960-1964

Month	1/1964	2/1963	1962	1961	1960
	... (1,000 Lbs.) ...				
January	8,526	8,173	5,077	4,303	3,632
February	8,397	7,361	6,360	4,902	3,502
March	8,584	8,835	7,036	5,831	4,706
April	8,064	7,919	6,408	4,484	3,492
May	8,136	7,293	5,818	3,879	3,253
June	8,237	8,774	6,137	4,039	3,995
July	-	4,524	4,679	3,962	4,088
August	-	6,684	6,687	4,963	3,558
September	-	6,921	7,180	5,745	4,631
October	-	9,877	9,871	6,759	5,275
November	-	8,136	7,406	5,789	4,790
December	-	7,450	6,019	5,191	4,459
Total	-	94,647	78,678	59,847	49,381

1/ Preliminary.

2/ Revised.



were up 0.5 million pounds or 2.1 percent, while fish sticks (15.4 million pounds) were down 3.0 million pounds or 16.3 percent.

Cooked fish sticks (14.2 million pounds) made up 92.0 percent of the April-June 1964 fish stick total. There were 24.1 million pounds of breaded fish portions produced, of which 19.0 million pounds were raw. Unbreaded fish portions amounted to 403,000 pounds.



The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 11.3 and 15.6 million pounds, respectively. The Inland and Gulf States ranked second with 2.4 million pounds of fish sticks and 8.3 million pounds of fish portions. The remaining 2.4 million pounds of fish sticks and fish portions were produced by firms in the Pacific States.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January-August 1, 1964, amounted to 21,726,482 pounds (about 1,034,600 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (25.2 percent) than the 29,036,028 pounds (about 1,382,700 standard cases) imported during January 1-August 3, 1963.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,370 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

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### PROCESSED EDIBLE FISHERY PRODUCTS, JUNE 1964:

United States imports of processed edible fishery products in June 1964 were up 3.2 percent in quantity and 12.4 percent in value from those in the previous month. In June there were larger imports of canned sardines not in oil, fresh and frozen groundfish fillets, and most other fish fillet items (except sea catfish fillets). The increase was almost offset by smaller shipments of fish blocks and slabs, sea catfish fillets, and canned albacore tuna in brine.

Compared with the same month in 1963, imports in June 1964 were up 9.1 percent in quantity and 19.8 percent in value. This June there were larger imports of flounder fillets, halibut steaks, swordfish steaks, yellow pike fillets, canned oysters, and canned sardines in oil and not in oil. But there was a considerable decline in arrivals of groundfish fillets and blocks and slabs as a result of smaller shipments from countries in Western Europe.

In the first 6 months of 1964, imports were up 1.3 percent in quantity and 5.3 percent in value from those in the same period of 1963. During January-June 1964, there was a sharp increase in imports of fish blocks and slabs, flounder fillets, and yellow pike fillets. But there was a considerable decline in imports of canned tuna, canned sardines, and canned crab meat.

Exports of processed edible fish and shellfish from the United States in June 1964 were up 27 percent in quantity and 17 percent in value from those in the previous month due to larger shipments of canned shrimp (increase mostly to Canada and the United Kingdom), canned mackerel, and canned sardines in oil and not in oil. Exports of canned salmon

U. S. Imports and Exports of Processed Edible Fishery Products, June 1964 with Comparisons

Item	Quantity				Value			
	June 1964	June 1963	June 1964	June 1963	June 1964	June 1963	June 1964	June 1963
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
<b>Fish &amp; Shellfish:</b>								
Imports	38.4	35.2	243.9	240.8	12.7	10.6	73.4	69.7
Exports	3.3	2.0	20.8	16.6	1.4	1.0	9.0	6.6

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

on (principally to the United Kingdom) showed little change from the previous month. There was a modest decline in exports of canned squid due to smaller shipments to Greece.

Compared with the same month of the previous year, the exports in June 1964 were up 65 percent in quantity and 40 percent in value. This June there were larger shipments of most of the leading canned fish export items except canned squid. Exports of canned salmon to the United Kingdom this June increased 319 percent from those in the same month a year earlier.

Processed fish and shellfish exports in the first 6 months of 1964 were up 25 percent in quantity and 36 percent in value from those in the same period of 1963. In January-June 1964 there were much larger shipments of canned mackerel. Shipments of canned salmon, canned sardines in oil, and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown were included in articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed fishery products are reported. The export data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, Sept. 1964 p. 45.

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### AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-APRIL 1964:

Airborne fishery imports into the United States in April 1964 were up 37.0 percent in quantity and 46.4 percent in value from those in the previous month due mainly to larger shipments of shrimp, particularly from Venezuela.

Total airborne shrimp imports in April 1964 consisted of 544,100 pounds of fresh and frozen raw headless and 34,247 pounds of unclassified shrimp. About 97 percent of the airborne shrimp arrivals in April 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.) and Los Angeles (Calif.).

Airborne imports of shellfish other than shrimp in April 1964 included Caribbean shipments of 30,446 pounds of spiny lobster products most of which entered through the Customs District of Florida, with the remainder going to Puerto Rico.

Airborne finfish imports in April 1964 consisted mainly of fish fillets from Mexico.

Total airborne fishery imports in January-April 1964 were down 25.1 percent in quantity and 28.9 percent in value from

U. S. 1/Airborne Imports of Fishery Products,  
January-April 1964 with Comparative Data

Product and Origin 2/	1964		1964		1963	
	April		Jan.-Apr.		Jan.-Apr.	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	Lbs.	1,000	Lbs.	1,000	Lbs.	1,000
<b>Fish:</b>						
Portugal	-	-	0.1	0.1	-	-
Mexico	29.3	8.0	108.8	30.4	99.2	31.1
British Honduras	-	-	1.8	0.4	30.6	7.6
Honduras	-	-	-	-	15.5	4.0
United Kingdom	-	-	-	-	2.0	8.2
Iran	-	-	1.7	3.2	1.1	2.7
France	0.4	0.6	4.3	1.8	1.2	7.4
Israel	-	-	1.3	0.8	0.4	0.3
Venezuela	-	-	4.6	1.7	-	-
Ireland	-	-	-	-	0.8	0.3
Denmark	-	-	0.2	0.1	-	-
Canada	-	-	13.2	4.3	-	-
Iceland	-	-	1.8	1.2	-	-
Spain	0.8	0.6	0.8	0.6	-	-
<b>Total fish</b>	<b>30.5</b>	<b>9.2</b>	<b>138.6</b>	<b>50.6</b>	<b>150.8</b>	<b>61.6</b>
<b>Shrimp:</b>						
Guatemala	-	-	-	-	101.5	53.9
El Salvador	57.0	35.5	144.1	86.4	145.2	101.7
Honduras	-	-	-	-	5.8	3.5
Nicaragua	24.5	13.9	31.1	18.0	193.4	61.6
Costa Rica	9.3	4.6	149.2	82.4	284.0	137.3
Panama	85.6	51.7	335.2	195.9	607.7	325.4
Venezuela	391.4	194.7	1,529.4	681.3	1,464.8	715.4
Ecuador	-	-	-	-	72.4	23.1
France	-	-	-	-	2.6	0.9
British Guiana	10.5	5.2	10.5	5.2	-	-
<b>Total shrimp</b>	<b>578.3</b>	<b>305.6</b>	<b>2,199.5</b>	<b>1,050.2</b>	<b>2,877.4</b>	<b>1,423.6</b>
<b>Shellfish other than shrimp:</b>						
Mexico	-	-	9.0	4.8	70.9	41.5
British Honduras	15.2	3.4	82.8	50.4	98.2	76.4
El Salvador	-	-	-	-	5.0	3.6
Honduras	-	-	8.4	8.6	1.6	0.8
Nicaragua	10.3	9.1	50.5	40.0	47.8	37.9
Costa Rica	-	-	9.3	9.5	73.8	60.1
Jamaica	11.6	10.0	43.6	36.2	45.3	33.4
Netherlands Antilles	-	-	-	-	29.1	18.3
Colombia	-	-	-	-	2.9	4.5
Ecuador	-	-	-	-	2.2	1.8
Tunisia	-	-	-	-	0.5	0.6
British Guiana	-	-	8.6	1.6	1.7	0.3
Canada	-	-	1.2	0.9	1.8	0.7
Venezuela	-	-	-	-	13.7	6.0
Dominican Republic	3.1	0.5	3.6	0.6	6.2	5.0
Bahamas	4.1	3.7	10.6	6.8	-	-
Haiti	1.3	0.7	4.0	2.1	-	-
Other countries	0.2	0.2	0.2	0.2	1.6	0.5
<b>Total shellfish (excl. shrimp)</b>	<b>45.8</b>	<b>27.6</b>	<b>231.8</b>	<b>161.7</b>	<b>401.3</b>	<b>291.4</b>
<b>Grand total</b>	<b>654.6</b>	<b>342.4</b>	<b>2,569.9</b>	<b>1,262.5</b>	<b>3,429.5</b>	<b>1,776.6</b>

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Net weight of shipments, including the weight of containers, wrappings, crates, and moisture control.

4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.

5/Less than 50 pounds.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, April 1964, U. S. Bureau of the Census.

those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobster tails.

The data as issued do not show the state of all products—fresh, frozen, or canned—but it is believed that the bulk of the airborne imports consists of fresh and frozen products.



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, AUGUST 1964:

The wholesale price index for edible fish and shellfish (fresh, frozen, and canned) dropped 1.1 percent from July to August 1964 mainly because of lower fresh and frozen shrimp prices. August prices for other fresh fishery products and canned fish were invariably higher or remained at the same level as in July except for lower prices on ex-vessel large haddock and frozen ocean perch fillets. At 105.4 percent of the 1957-59 average, the index this August was lower by only 0.1 percent from the same month a year earlier. Lower prices for a number of fresh and frozen fishery products this August than in August 1963 were offset by higher prices for fresh and frozen shrimp, fresh halibut, and most of the canned fish items.

A decline of 0.3 percent from July to August in the subgroup index for drawn, dressed, or whole finfish was the direct result of lower ex-vessel prices at Boston for large haddock (down 6.0 percent). August prices for western fresh halibut at New York City rose 3.7 percent from the previous month because of a drop in seasonal Pacific Northwest halibut landings, and those prices were up 7.6 percent as compared with August 1963. Prices this August were higher than in July for Great Lakes fresh yellow pike (up 5.9 percent), but were unchanged for other items in the subgroup. As compared with August 1963, all items in the subgroup except halibut were lower-priced this August and the subgroup index was down by 1.2 percent.

The subgroup index for processed fresh fish and shellfish in August 1964 was down 4.2 percent from the previous month. Lower prices for South Atlantic fresh shrimp (down 8.9 percent) at New York City were largely responsible, but prices for fresh haddock fillets at Boston rose (up 2.9 percent). As compared with the same month a year earlier, the subgroup index this August was lower by 3.3 percent because of lower prices for haddock fillets and shucked standard oysters, while fresh shrimp prices were 9.3 percent higher than in August 1963.



From July to August, prices dropped for ocean perch fillets (down 1.7 percent) at Boston and frozen shrimp (down 4.1 percent) at Chicago, and the subgroup index for frozen fish and shellfish dropped 2.4 percent. Prices for other fish fillets in the subgroup were unchanged from the previous month. As compared with August 1963, the subgroup index this August was higher by 1.1 percent because of higher prices for frozen shrimp and haddock fillets.

The subgroup index for canned fishery products was up 0.9 percent from July to August as a result of price increases for canned tuna (up 0.5 percent) and canned Maine sardines (up 5.7 percent). Because of intensive advertising, demand for tuna was up but price increases in August were nominal and confined only to certain packers' brands. But canned tuna prices in the aggregate were 6.2 percent higher this August than in the same month of 1963. Higher prices for canned Maine sardines generally stemmed from the relatively light 1964 season pack. As of August 29, the new pack was 525,000 cases—substantially less than the pack of 1.3 million cases for the same period in 1963. Prices for canned pink salmon this August were unchanged from the previous month, but supplies will continue liberal. The total Alaska salmon pack this year was about 3.4 million cases as of the end of August, with pink salmon accounting for more than half of the total. The subgroup index this August was lower than in August 1963 by 1.5 percent. Prices for all items in the subgroup were above those of a year earlier, but canned pink salmon prices were 7.3 percent lower because of liberal supplies.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1964 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Aug. 1964	July 1964	Aug. 1964	July 1964	June 1964	Aug. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					105.4	106.6	105.6	105.5
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					106.9	109.3	107.8	108.0
Drawn, Dressed, or whole fish . . . . .					114.6	114.9	106.3	116.0
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.11	.11	83.3	88.6	75.2	84.6
Halibut, West., 20/80 lbs., drsd., fresh or froz. . . . .	New York	lb.	.42	.40	122.7	118.3	107.0	113.8
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.93	.93	129.2	129.2	124.7	129.2
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.53	.53	78.3	78.3	63.4	98.5
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.54	.51	88.4	83.5	69.6	104.8
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					101.1	105.5	114.8	104.5
Fillets, haddock, sml., skins on, 20-lb. tins . . . . .	Boston	lb.	.36	.36	86.2	83.8	77.7	91.1
Shrimp, lge. (26-30 count), headless, fresh . . . . .	New York	lb.	.77	.84	89.6	98.4	117.2	82.0
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.00	7.00	118.0	118.0	118.0	134.9
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					100.0	102.5	98.7	98.9
Fillets: Flounder, skinned, 1-lb. pkg. . . . .	Boston	lb.	.38	.38	96.0	96.0	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.37	.37	108.5	108.5	101.1	105.5
Ocean perch, lge., skins on 1-lb. pkg. . . . .	Boston	lb.	.31	.31	106.9	108.7	105.2	115.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg. . . . .	Chicago	lb.	.80	.84	94.9	99.0	96.6	93.1
<b>Canned Fishery Products:</b> . . . . .					103.1	102.2	102.2	101.6
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	22.25	22.25	97.0	97.0	97.0	104.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.56	11.50	102.6	102.1	102.1	96.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/sc. . . . .	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	9.31	8.81	119.4	113.0	113.0	104.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



## SHRIMP FARMING

The idea of shrimp farming, or cultivation of shrimp under controlled conditions in salt- or brackish-water ponds, has aroused much interest in the United States in recent years. Shrimp appear particularly desirable for artificial cultivation because of their rapid growth and high market value. In addition to their worth as human food, shrimp are in great demand seasonally as live bait for sport fishing.

Methods used in shrimp farming take advantage of the ability of certain shrimp to survive and grow rapidly in shallow estuarine waters. By constructing ponds, the shrimp farmer alters the natural environment so that the poundage of shrimp normally harvested from the estuarine areas is greatly increased. It is anticipated that by proper timing, a shrimp farmer may control the development of his stocks, so that abundant live-bait shrimp of appropriate size can be harvested at the peak of demand.

The culture of shrimp and other marine animals is an important industry in certain maritime countries of Southeast Asia. Shrimp farming in the United States is still in its infancy, however, and extensive research is required to determine its biological and economic feasibility.

Note: Shrimp culture as it is practiced in Southeast Asia and possible application of techniques developed there to shrimp farming in the United States are discussed in Fishery Leaflet 551, "Shrimp Farming," U. S. Bureau of Commercial Fisheries, Washington, D. C.



# FOREIGN

## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MAY 1963-1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Production and exports of fish meal by FEO countries during January-May 1964 were up substantially from that same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries  
of the FEO, January-May 1963-1964

of the EC, January-May 1964					
Country	May		Jan.-May		Total 1963
	1964	1963	1964	1963	
	(1,000 Metric Tons).				
Chile . . . . .	9.2	1/	62.2	1/	1/
Angola . . . . .	2/	2.4	2/	11.5	30.0
Iceland . . . . .	7.2	7.2	47.7	34.0	99.1
Norway . . . . .	17.5	7.4	95.4	36.0	102.1
Peru . . . . .	133.0	78.1	664.0	529.7	1,159.4
S. Africa (including S.-W. Africa) . . . . .	27.5	14.1	90.2	56.3	198.8
Total . . . . .	194.4	109.2	959.5	667.5	1,589.4

Table 2 - Production of Fish Meal by Member Countries  
of the FEO, January-May 1963-1964

Of the FEO, January-May 1965 1964					
Country	May		Jan.-May		Total
	1964	1963	1964	1963	
	(1,000 Metric Tons).				
Chile . . . . .	14.5	1/	75.3	1/	86.8
Angola . . . . .	2/	2.3	2/	10.8	31.5
Iceland . . . . .	4.5	4.6	35.7	34.8	87.2
Norway . . . . .	11.2	10.6	86.1	25.6	132.2
Peru . . . . .	123.4	160.2	777.8	602.9	1,159.2
So. Africa (including S.-W. Africa) . . . . .	33.4	33.2	130.0	114.7	238.0
Total	187.0	210.9	1,104.9	788.8	1,734.9

1/Data not available. Chile became a member of FEO at the end of 1963.

2/Data not reported. January 1964 exports were 4,800 tons; January 1964 production was 5,600 tons.

During the first 5 months of 1964, Peru accounted for 59.2 percent of total fish-meal exports reported by FEO countries, followed by Norway with 9.9 percent, South Africa with 9.4 percent, Chile with 6.5 percent, and Iceland with 5.0 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 15, 1964.)

\* \* \* \* \*

#### WORLD PRODUCTION, APRIL-MAY 1964 AND JANUARY-MAY 1964:

World fish meal production in April 1964 held steady at about the same level as in the previous month and then moved somewhat lower in May 1964, according to preliminary data from the International Association of Fish Meal Manufacturers. The modest decline in May 1964 was due mainly to a drop in output in Peru, Norway, and Iceland, which was partly offset by rising production in the United States.

World Fish Meal Production by Countries,  
January-May 1963-1964

Country	April		May		Jan.-May	
	1964	1963	1964	1963	1964	1963
	.. (Metric Tons) ..					
Canada	1,460	1,311	3,941	5,020	16,401	31,944
Denmark	6,551	7,081	8,466	10,267	30,074	35,959
France	1,100	1,100	1,100	1,100	5,500	5,500
German Fed. Republic	6,736	7,461	5,279	5,795	31,550	33,128
Netherlands	500	500	400	300	2,900	1,700
Spain	1/	2,180	1/	1,673	1/	10,869
Sweden	885	822	531	754	3,428	2,783
United Kingdom	7,217	6,438	5,467	5,752	33,812	32,193
United States	6,434	2/7,565	24,765	23,195	2/36,512	250,970
Angola	1/	1,345	1/	2,276	3/5,566	11,174
Iceland	10,094	8,742	4,547	4,602	35,669	34,814
Norway	31,582	4,000	11,228	10,549	86,048	25,019
Peru	158,505	129,104	123,336	160,209	777,778	602,850
So. Africa (incl. S.-W. Africa)	31,543	33,237	33,297	32,278	134,277	113,604
Belgium	375	375	375	375	1,875	1,875
Chile	13,343	1/	14,501	1/	75,253	1/
Morocco	350	1/	2,150	1/	4,060	1/
Total	276,715	211,261	239,383	277,245	1,280,803	994,382

1/Data not available.

2/Revised.

3/Data available only for January 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present. Chile and Morocco did not report production prior to 1963.

World fish meal production in the first 5 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 61 percent of world output during January-May 1964. There was also a noticeable increase in Norwegian and South African production in January-May 1964. The gain was offset partly by a sharp drop in Canadian and United States output.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

\* \* \* \* \*

#### WORLD TRADE, 1958-1963:

World exports of fish meal, including fish solubles and similar products, reached a record level in 1963, reflecting increased shipments from all major suppliers except Angola (table 1).

## International (Contd.):

Country	2/1963	1962	1961	1960	1959	1958	Average 1955-59
..... (1,000 Short Tons) .....							
Canada <sup>3/</sup>	56.7	48.2	40.6	35.5	46.9	29.3	44.3
Argentina	3.5	1.7	3.3	1.7	2.5	1.9	1.9
Chile	95.7	80.3	45.8	26.6	19.1	11.9	10.0
Peru	1,278.4	1,175.0	838.4	571.3	306.1	117.4	109.1
Belgium	3.4	6.4	4.2	4.7	2.3	2.0	2.4
Denmark <sup>3/</sup>	74.5	68.0	47.1	35.4	77.7	66.8	54.8
Faroe Islands	1.9	2.2	1.2	3.9	7	6	6
France	2.0	1.7	3.7	4.6	8	9	4/1.1
West Germany	6.0	9.5	9	6.3	8.0	8.5	6.8
Iceland	114.8	76.8	78.0	60.5	48.7	60.2	42.1
Netherlands	5.9	6.6	5.2	6.2	9.2	6.7	6.7
Norway	113.9	65.9	141.6	112.4	98.3	118.0	148.0
Portugal	8	2.9	5.0	2.5	6	1.5	1.3
Sweden	3	3	6	3	1.1	1.5	9
U.S.S.R.	5/4.0	4.1	5.4	4.4	5.3	4.2	4.1
Angola	39.8	35.9	55.5	49.7	56.5	89.6	72.8
Morocco	21.9	17.6	20.9	15.3	16.0	18.4	13.0
So. Africa Republic 3/6/	235.8	228.7	186.7	139.7	110.1	98.6	78.9
Japan	4.0	20.0	5.3	6.9	26.5	26.1	15.4
Total	2,052.3	1,851.8	1,486.4	1,083.3	836.6	664.7	614.2
<sup>1/</sup> Includes fish solubles and similar products.							
<sup>2/</sup> Preliminary.							
<sup>3/</sup> Includes fish solubles.							
<sup>4/</sup> 1957-59 average.							
<sup>5/</sup> Estimated.							
<sup>6/</sup> Includes the production of South-West Africa.							

Country	1/1963	1962	1961	1960	1959	1958	Average 1955-59
..... (1,000 Short Tons) .....							
Canada	3.0	1	6.4	2.1	-	-	-
Mexico	30.7	22.1	13.6	16.8	10.4	4.0	3.9
United States	386.5	255.8	221.4	133.5	147.3	109.0	107.7
Colombia <sup>2/</sup>	2.8	1.8	6	6	-	-	2
Venezuela	16.6	14.6	12.9	4.8	5.0	2.8	2.9
Austria	33.4	30.9	26.5	24.0	14.1	16.1	12.7
Belgium	56.6	62.8	44.0	54.8	32.9	31.0	24.7
Denmark	13.6	17.1	30.6	20.8	14.8	12.0	12.8
Finland	8.0	17.8	13.7	7.2	3.9	3.8	3.3
France	84.3	90.9	66.4	35.1	43.9	46.5	30.5
West Germany	332.4	365.8	295.3	212.6	166.1	137.0	128.1
Ireland	8.2	5.8	4.8	4.4	4.3	5.0	3.4
Italy	67.5	53.6	34.3	33.7	14.6	15.9	10.7
Poland	193.7	190.2	178.9	150.3	110.1	92.5	88.0
Netherlands	33.1	17.3	11.8	7.1	2.2	1.6	2.1
Spain	84.1	41.5	14.6	10.2	-	2.7	1.4
Sweden	33.0	26.1	24.5	19.3	20.6	12.6	13.7
Switzerland <sup>2/</sup>	32.0	31.4	27.4	30.5	17.0	14.6	14.0
United Kingdom	310.5	305.0	257.5	186.3	164.7	102.0	127.2
Yugoslavia	3/24.7	3.1	3.8	13.9	8.1	-	1.8
Rhodesia/ <sup>1/</sup> Nyasaland	4/5.5	5.4	5.9	4.7	5.3	5.4	4/4.9
Israel	11.3	5/11.0	13.1	17.7	13.3	22.3	14.3
Japan	22.9	42.4	25.7	21.4	-	-	-
Malaysia	5/9.7	16.8	15.1	11.6	6.8	5.0	3.6
Philippines	3/7.0	6.9	10.3	3.3	5.4	3.8	3.8
Total	1,881.1	1,636.3	1,359.2	1,026.7	810.8	670.6	615.7
<sup>1/</sup> Preliminary.							
<sup>2/</sup> Includes small amount of meat meal.							
<sup>3/</sup> January-September.							
<sup>4/</sup> Estimated.							
<sup>5/</sup> January-June.							

Fish meal is a high-protein concentrate that contains the amino acids necessary to good animal nutrition. As animal feed, it is usually incorporated in balanced mixtures of vegetable substances to which minerals and vitamins are added. The bulk of fish meal production is used in poultry and hog rations and, when prices are competitive with other protein concentrates, in other livestock rations.

In general, exports of fish meal follow the pattern of production as the greater part of the output is exported in major producing countries such as Peru, South Africa Republic, Norway, Iceland, Denmark, Angola, and Morocco. The main exceptions are the United States, Japan, and the Soviet Union where virtually all the production is retained for domestic use.

There has been a marked change in the regional pattern of world exports. Prior to 1959, Europe was the leading exporting region but with the rapid development in the productive capacity for fish meal in other parts of the world, South America has become the leading exporting region and Africa has emerged as an important source of supply. Exports from North America continue, as in the past, almost entirely from Canada. Asian exports are insignificant compared with those from other regions.

Peru continued as the leading fish meal supplier in 1963. By areas of destination the percentage distribution of Peruvian fish-meal shipments in 1963 was as follows: Western Europe 61.2 percent; North and South America 25.0; Eastern Europe 7.0; Asia 6.4; and Oceania 0.4 percent.

Record quantities of fish meal were shipped from the South Africa Republic in 1963. Western Europe absorbed 56 percent of South African fish-meal exports in 1963, followed by Asia with 18 percent, Eastern Europe with 14 percent, North and South America with 4 percent, Africa with 3 percent, and Oceania with 2 percent.

Exports of fish meal from Norway and Iceland increased significantly in 1963. Virtually all shipments from both those countries in 1963 went to other Western European countries, except for small quantities (about 14 percent in 1963) which were sold to Eastern Europe.

Chile's exports of fish meal, which have been increasing steadily in recent years, totaled a record 95,700 tons in 1963. Chilean fish-meal exports in 1963 were mainly to Western Europe which took 60 percent of the total. Of the remainder, North and South America accounted for 37 percent, Eastern Europe 2 percent, and Asia 1 percent.

The greater part of the fish-meal shipments from Denmark, Angola, and Morocco goes to Western Europe except for small quantities (about 12 percent in 1963) going to Eastern Europe. Over 80 percent of Canadian exports of fish meal in 1963 went to the United States, and most of the remainder went to the United Kingdom.

Most of the increase in world supplies of fish meal since 1959 has been absorbed by Western European countries and by the United States, now the world's leading fish-meal importer. Increased imports have also been recorded by countries in South and Central America, Asia, and Eastern Europe.

Combined imports in 1963 by leading fish-meal buyers increased considerably over 1962 (table 2). Purchases by the United States rose 130,700 tons, and those by Japan, Spain, Yugoslavia, Italy, and Poland rose collectively by 144,400 tons. Those increases more than offset reduced purchases by West Germany, Finland, France, Belgium, and Denmark.

In Eastern Europe, estimated purchases of fish meal by East Germany fell to 80,000 tons in 1963 from 102,000 in 1962. Imports into Czechoslovakia and Hungary, however, increased in 1963 to an estimated 17,500 and 20,500 tons, respectively, from an estimated 17,000 and 16,500 tons in 1962. (World Agriculture Production and Trade, July 1964.)

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## INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS' FIFTH ANNUAL CONFERENCE:

The Fifth Annual Conference of the International Association of Fish Meal Manufacturers will be held in Vienna, Austria, September 29-October 2, 1964.

## International (Contd.):

The Association, which was formed in 1959, is a recognized international body representing the world fish meal industry as a whole, and is designed to promote cooperation among all manufacturers. It thus provides a forum for discussions between producers, many of whom are also engaged in foreign trade, and experts who are concerned with the many commercial, promotional, scientific, and technical problems affecting the industry.

Over 100 delegates from the 17 member countries, as well as official observers from Japan, Mexico, and Argentina, were expected to attend the Vienna Conference. In addition, agents, importers, and brokers who are interested in fish meal marketing were invited to attend the opening and closing sessions, and to be present as observers at a special working session.

Member countries, all of whom were expected to send delegates to the Conference, are: Belgium, Canada, Chile, Denmark, France, West Germany, the Netherlands, Iceland, Morocco, Norway, Peru, Portugal, So. Africa Republic, Spain, Sweden, the United Kingdom, and the United States.

Organizations and agencies which were to be represented at the Conference include the Fishmeal Exporters Organization (FEO), with which the Association cooperates on promotional and similar matters; the U. S. Bureau of Commercial Fisheries, which is actively engaged in research on fish protein concentrate for human nutrition; and the Food and Agriculture Organization (FAO) of the United Nations.

Fish meal is easily incorporated as a high-grade protein ingredient in animal feeds, particularly for intensively reared stock such as poultry and pigs. Fish flour or fish protein concentrate for human consumption may become an important factor in combating malnutrition. In those and other activities the Association cooperates with FAO; the United Nations Children's Fund (UNICEF); and the Freedom from Hunger Campaign. The Association also cooperates with groups such as the European Federation for Animal Technology (FEZ) and other regional bodies such as the Expert Committee in the European Economic Community. (International Association of Fish Meal Manufacturers, July 1964.)

## MARINE OIL

## WORLD PRODUCTION, 1963:

In 1963, world production of marine oils (excluding seal oil) totaled an estimated 1,071,500 short tons, 16 percent below that of the previous year. Production of baleen whale oil and fish oil declined by an estimated 109,700 and 94,200 tons, respectively. Sperm oil production, however, rose 5 percent in 1963.

World Marine Oil Production, 1961-63

Item	1/1963	1962	1961
..... (1,000 Short Tons) .....			
Baleen whale oil . . . .	280.4	390.1	427.7
Sperm whale oil . . . .	135.8	129.8	119.9
Fish and fish-liver oil . .	655.3	749.5	668.6
Total . . . . .	1,071.5	1,269.4	1,216.2
1/Preliminary.			

The production of seal oil in 1963 is estimated at 3,600 tons, compared with an estimated 4,600 tons produced in 1962.

## INTERNATIONAL PACIFIC HALIBUT COMMISSION

## NORTH PACIFIC HALIBUT FISHING IN AREA 3A ENDED AUGUST 19, 1964:

Fishing in Pacific halibut Area 3A ended at 6 p.m. (P.S.T.) on August 19, 1964. The International Pacific Halibut Commission announced the closure on July 31, 1964, since it estimated that by August 19 the catch limit of 34 million pounds for Area 3A would be reached. Area 3A includes waters off the coast of Alaska between Cape Spencer and Kupreanof Point (near the Shumagin Islands). There will be no halibut fishing in Area 3A after August 19, 1964, until the area is reopened in 1965.

This year Area 3A was open to fishing for 110 days--18 days more than the 92-day season in 1963. In 1962, the area was open to fishing for 94 days, in 1961 for 105 days, in 1960 for 85 days, in 1959 for 92 days, and in 1958 for 119 days.

North Pacific halibut landings by United States and Canadian vessels for 1964 through July 31, 1964, were: 14.4 million pounds in Area 2; 26.3 million pounds in Area 3A; 2.1 million pounds in Area 3B South; 359,000 pounds in Area 3B North; and 1.5 million pounds in Area 3B North Triangle. Total United States and Canadian landings as of July 31, 1964, totaled 44.7 million pounds as compared with 56.7 million pounds for the same period of 1963.

There has been no announcement concerning the closure of any of the other North Pacific halibut fishing areas which are subject to quota limitation. The North Pacific halibut fishing regulations for 1964 provide that the season in Area 2 shall terminate at the time of the attainment of a catch limit of 25 million pounds or on September 15, whichever is earlier; fishing in Area 3B South shall terminate at the time of the attainment of a catch limit of 4 million pounds or on October 15, whichever is earlier; fishing in Area 3B North (without catch limit) shall terminate on October 15; and the season in Area 3B North Triangle shall terminate at the time of the attainment of a catch limit of 6,393,340 pounds or on October 15, whichever is earlier (the catch limit in Area 3B North Triangle is to be shared between the United States, Canada, and Japan).

The halibut catch during the 1964 season in Area 2 and the Bering Sea areas has been substantially below that during the previous sea-

## International (Contd.):

son. Those developments were considered at a special meeting of the International Pacific Halibut Commission on June 4, 1964. Following the meeting it was announced that the catch-limit area of the Bering Sea was tentatively scheduled for complete closure during 1965 and that North Pacific halibut fishing off the United States and Canadian coasts would be closely surveyed to determine if further restrictions would be required.

Note: See Commercial Fisheries Review, August 1964 p. 49.

## INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION

## PANEL OF EXPERTS ON STABILITY OF FISHING VESSELS HOLDS FIRST SESSION IN LONDON, JULY 13-17, 1964:

A Panel of Experts on Stability of Fishing Vessels has been established by the Inter-Governmental Maritime Consultative Organization (IMCO). The action was taken following the third IMCO Assembly, which resolved that "IMCO should continue its studies on the stability of fishing vessels with all possible speed." The Panel will serve as a subsidiary body to the Working Group on Intact Stability of Ships, which is already concerned with stability studies of all types of ships including fishing vessels.

The object of the Panel as defined at its first session, July 13-17, 1964, in London is "to collect and study data, instigate further research, and disseminate information and recommendations on the stability of fishing vessels of different types and dimensions, with the ultimate object of establishing criteria for judgement of stability, and to insure that the master is furnished with adequate and understandable information for his guidance."

The first session of the Panel of Experts was attended by representatives of Denmark, West Germany, Finland, France, Iceland, Italy, Japan, Netherlands, Norway, Poland, Sweden, U. S. S. R., United Kingdom, United States, and by a representative of the Food and Agriculture Organization (FAO) of the United Nations.

The Panel agreed upon the following terms of reference:

1. To classify fishing vessels without limitation of size in different groups with regard to dimensions, type, fishing methods, and operating areas for the purpose of the studies to be carried out by the Panel.
2. To study and analyze casualty records of fishing vessels from different groups which have foundered or suffered dangerous heeling.
3. To collect, analyze, and compare existing national stability requirements, recommendations, and criteria for fishing vessels together with supporting information about the principles involved.
4. To compile on a uniform basis intact stability calculations (with curves) for different groups of fishing vessels, using parameters already established by the Working Group on Intact Stability of Ships, and using actual conditions of loading as practiced in specific fisheries.
5. To formulate recommendations with regard to stability criteria to be used for fishing vessels of the different groups.

6. To investigate the possibility of establishing simple methods to be used in judging the stability of small fishing vessels.
7. To investigate the desirability of establishing minimum freeboard requirements for fishing vessels.
8. To formulate recommendations with regard to watertight integrity and constructional details of fishing vessels which affect stability such as hatches, superstructures, binboards, freeing ports, safety releases, etc.
9. To investigate the possibility of standardizing assumptions with regard to wind and wave forces applicable to fishing vessels and to cooperate with the Working Group on Intact Stability of Ships in the research necessary to verify those assumptions.
10. To develop proposals for appropriate simple operating guidance to fishing crews regarding stability, avoiding as far as possible the necessity of making calculations at sea.
11. To collect information on present theoretical investigations and research work regarding the stability of fishing vessels and their general behavior at sea insofar as this affects stability.
12. To establish a long-range research program on the stability of fishing vessels and their general behavior at sea insofar as this affects stability.
13. To consider operational practices which have an unfavorable effect on the intact stability of fishing vessels and to recommend reasonable and practicable precautions which would prevent the reduction in stability or to keep it within acceptable limits.

At the London meeting, the Panel of Experts considered what work could be started immediately under those terms of reference. As a result, some members volunteered to carry out certain studies and report to the Panel at its next session. The Panel also prepared the following preliminary suggestions concerning fishing vessel stability:

1. All doorways and other openings through which water can enter into the hull or deck houses, forecabin, etc. should be suitably closed in adverse weather conditions, and accordingly all appliances for that purpose should be kept on board in good condition.
2. Hatchcovers and flush deck scuttles should be kept properly secured when not in use during fishing.
3. All porthole deadlights should be maintained in good condition and securely closed in bad weather.
4. All fishing gear and other large weights should be properly stowed and placed as low as possible.
5. Particular care should be taken when pull from fishing gear might have a bad effect on stability—for example, when nets are hauled by powerblock or when a trawl net snags on the bottom.
6. Gear for releasing the deck load in fishing vessels carrying their catch on deck should be kept in good working condition for use when necessary.
7. Freeing ports provided with closing appliances should always be capable of functioning and should not be locked, especially in bad weather.
8. When the main deck is prepared for a deck load by setting up pound boards, there should be slots of suitable size between the pound boards to allow easy flow of water to freeing ports in order to prevent the trapping of water.
9. Never carry fish in bulk without first being sure that the portable divisions in the holds are properly installed.

## International (Contd.):

10. At any one time keep the number of partially filled tanks to a minimum.
11. Observe any instructions given regarding filling of water-ballast tanks, but always remember that slack tanks can be dangerous.
12. Any closing devices provided for vent pipes to fuel tanks should be secured in bad weather.
13. Reliance on automatic or fixed steering can be dangerous as it prevents quick maneuvers which may be needed in bad weather.
14. Be alert to all the dangers of following or quartering seas. If excessive heeling or yawing occurs, reduce speed as a first precaution.
15. In all conditions of loading, necessary care should be taken to maintain a seaworthy freeboard.
16. Pay special attention to icing of a vessel and reduce it by all possible means.

## ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

POSITION ADOPTED ON FISHING INDUSTRY SUBSIDIES:

The Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) met in Paris, June 29-30, 1964, and considered a report on subsidies and other financial support to the fishing industries of member countries. The Fisheries Committee then issued recommendations making distinctions between justifiable subsidies and those which should be eliminated. The conclusions of the Fisheries Committee were endorsed by the Council of OECD in a statement to the press, July 21, 1964, the text of which follows:

"The Council of OECD recommends the Governments of member countries, when they determine their fishery policies, to take into consideration the conclusions of a study carried out by the Fisheries Committee on subsidies and other financial support to the fishing industries.

"The Report by the Fisheries Committee makes a distinction between subsidies which are likely to create difficulties at international level by creating or perpetuating abnormal conditions for the fishing industry, and those which may be necessary for developing the fishing industry and raising its productivity or for facilitating the alternative employment of fishermen."

"These (subsidies which may be necessary) include government regulations for landing prices or sales and other nondiscriminatory systems drawn up and applied by the governments in order to fix or to regulate the prices. These systems involve no financial grant, however, other than the payment of the administrative costs or at least only a subsidy low enough to have no practical effect on the general level of prices.

"In the same way, social and economic motives may justify subsidies and other financial aids designed to encourage investment by small firms or individuals who have not the financial means needed to improve their equipment. These technical improvements, however, must result in profitable modernization likely to raise the fishermen's standard of living and insure them normal incomes.

"On the other hand, financial aids which favor home producers by reducing their costs of exploitation should be gradually diminished until their total abolition. Such aids have too great an influence on imports or exports.

"The Fisheries Committee also condemns catch premiums and subsidies given to fishermen on the basis of the quantity of fish landed, gross proceeds, or time spent at sea. Such

schemes should only be introduced by way of exception and for a period not exceeding three years. In those countries where such subsidies have been made for more than 5 years, the aim should be to reduce them gradually with the object of abolishing them within 10 years.

"In the case of support given to traditional production which is diminishing but which gives rise to marketing difficulties, the possibilities of structural changes should be considered if the difficulties encountered by the sectors concerned tend to become permanent. The present aids, in so far as they facilitate the placing of exports, might well affect the international trade in fish and in this case the position on the international markets should be given careful attention.

"Care should also be taken not to encourage the tendency to overinvestment so as to avoid an artificial increase of the production capacity of the fleet in non-profitable conditions of exploitation. To this effect, it is generally acknowledged that scrapping premiums, shipbuilding and other investment subsidies for the benefit of fisheries are only acceptable if they are to be in force for a period of less than 5 years and/or the amount granted does not exceed 25 percent of the building costs of a new vessel.

"Moreover the rate of interest for loans granted to the fishing industry must be comparable with the average rates of interest regarded as normal for private loans for similar purposes in the same country.

"Finally, financial aid given to shipbuilding has not been considered as a subsidy for the fishing industry so long as it does not reduce the costs of investment to the buyer of a vessel below the cost of purchasing a similar vessel from a foreign shipyard.

"These general recommendations are accompanied by country recommendations which take account of the structures of the different national fishing industries and the economic conditions which might influence the fishing situation." (Organization for Economic Cooperation and Development, Paris, July 21, 1964.)

\* \* \* \* \*

FISH PROMOTIONAL MATERIALS PLANNED:

Fish promotional materials in the form of colored illustrations of various fish species are planned to be issued by the German Fish Promotion Service (Deutsche Fischwerbung e.V.) as a cooperative fish promotion service under the Organization for Economic Cooperation and Development (OECD). The illustrations would be available to persons or agencies in OECD Member Countries who are interested in fish promotion services, and they are encouraged to participate in this cooperative effort.

The proposed illustrations are based on water colors and would be suitable for use in retail or wholesale fish establishments, for educational school material, or for display at fishery group meetings. They would measure about 17 x 23 inches consisting of 12 different fish species including herring, ocean perch, cod, haddock, mackerel, halibut, wolffish (ocean catfish), shrimp, tuna, and several other species. The names of the different fish



## International (Contd.):

species could be shown in several languages. The price for the illustrations would vary according to the number of copies ordered and would range from about 10 to 15 U. S. cents each.

For further information, interested persons may write directly to: Deutsche Fischwerbung, 2 Karlsburg, 2850 Bremerhaven 1, West Germany, or through the Fisheries Division, Organization for Economic Cooperation and Development, 2 rue Andre-Pascal, Paris 16e, France.

Member Countries of the OECD include the United States, Canada, Japan, the European Common Market countries, member countries of the European Free Trade Association (EFTA), and others.

## UNITED NATIONS

## CONVENTION ON THE TERRITORIAL SEA AND THE CONTIGUOUS ZONE ENTERS INTO FORCE:

The Convention on the Territorial Sea and the Contiguous Zone (which was adopted by the United Nations Conference on the Law of the Sea in April 1958 at Geneva) entered into force September 10, 1964, following ratification by 22 countries. The Dominican Republic deposited the 22nd ratification August 11, 1964. The United States ratified the Convention on April 12, 1961. The Convention embodies the results of work of the 1958 United Nations conference, but does not cover the width of the territorial sea. Among other things, the Convention establishes specific rules for the right of innocent passage of ships through territorial waters, with separate reference to merchant vessels, government-owned ships used commercially, and warships. The Convention describes the rights and duties of states through whose waters the ships pass.

It also provides for the use of the low-water line as the baseline for measuring the breadth of the territorial sea, except as otherwise provided for in the Convention. The exception allows for the use of the straight baseline method (Article 4) in localities where the coast is deeply indented or if there is a fringe of islands immediately adjacent to the coast.

The Convention also recognizes the right of a coastal state to exercise jurisdiction over a "contiguous zone" extending up to 12 miles from the baselines from which the territorial

sea is measured, for the purpose of allowing the coastal state to exercise control necessary to: "(a) prevent infringement of its customs, fiscal, immigration, or sanitary regulations within its territory or territorial sea; (b) punish infringement of the above regulations committed within its territory or territorial sea."

The 1958 United Nations Conference on the Law of the Sea also formulated the (1) Convention on the High Seas; (2) Convention on the Continental Shelf; and (3) Convention on Fishing and Conservation of the Living Resources of the High Seas. All of those Conventions have entered into force, except the Convention on Fishing and Conservation of the Living Resources of the High Seas which in August 1964 had only 16 of the 22 ratifications needed before coming into force.

Note: See *Commercial Fisheries Review*, June 1961 p. 90; May 1960 p. 40.

## WHALING

## ANTARCTIC WHALE OIL AND SPERM OIL PRODUCTION, 1962/63 AND 1963/64 SEASON:

Total marine oil production from pelagic whaling in the Antarctic during the 1963/64 season was down about 9 percent from that in the previous season due to a drop of 20 percent in whale oil output. All countries participating in Antarctic whaling during the 1963/64 season reported lower production except Norway. The decline in whale oil production was partly offset by a gain of 54 percent in sperm oil production. The Japanese and Soviet fleets accounted for most of the gain in sperm oil.

Marine Oil Production from Pelagic Whaling in the Antarctic, 1962/63 and 1963/64 <sup>1/</sup>				
Country	Season	Whale Oil	Sperm Oil	Total
Norway	1963/64	202,215	50,273	252,488
	1962/63	183,345	42,620	225,965
Netherlands	1963/64	47,971	15,411	63,382
	1962/63	62,916	17,491	80,407
Japan	1963/64	561,035	120,093	681,128
	1962/63	666,335	61,959	728,294
U.S.S.R.	1963/64	214,438	167,715	382,153
	1962/63	312,517	94,299	406,816
United Kingdom	1963/64	-	-	-
	1962/63	67,260	13,100	80,360
World total	1963/64	1,025,659	353,492	1,379,151
	1962/63	1,292,373	229,469	1,521,842

<sup>1/</sup>Preliminary.

<sup>2/</sup>Six barrels equal one long ton.

A total of 16 factoryships participated in the 1963/64 Antarctic whaling season--1 less

## International (Contd.):

than in the previous season. After the 1962/63 season the British Antarctic whaling factory-ship was sold to Japan. (United States Embassy, Copenhagen, June 30, 1964.)



## Aden

### FISHERIES DEVELOPMENT PROJECT:

To help develop fisheries in the Gulf of Aden and adjacent waters, the United Nations Special Fund has contributed £330,000 (US\$924,000) and the United Kingdom has contributed £160,000



(\$448,000) for a fisheries survey and training project. The development project is expected to continue for 3 years and includes provisions for chartering 2 fishing vessels to be used in training local fishermen in the Aden area. The project is being carried out by the Food and Agriculture Organization of the United Nations. (Fish Trades Gazette, July 4, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 39.



## Australia

### SCALLOP CATCH ON NEW GROUNDS OFF VICTORIA:

During October 1963-February 1964, the Australian newly-developed Port Phillip Bay (Victoria) scallop beds yielded 35,800 bags of scallops (611,000 pounds of meats). Those scallops are being marketed in Melbourne and exported (France being the best customer).

In past years Tasmania has been Australia's main source of scallops with production reaching a record 1,257,076 pounds (worth A£160,000 or US\$358,400 ex-vessel) in 1962. Production dropped to 978,864 pounds in 1963, when the main season was four months.

A meeting of licensed scallop and snapper long-line fishermen in Melbourne agreed to

restrictions being placed on scallop dredging operations in certain areas of Port Phillip Bay during April, May, and September. The only areas in which scallop fishing will be allowed during those months are south of an imaginary line from Indented Head to Snapper Point, near Mornington, and north of a line from Point Cook to Green Point, near Brighton. Long-line fishermen who operate gear within the areas set aside for scallop dredging will do so at their own risk. The meeting was called by the Victorian Fisheries and Wildlife Department to find an acceptable solution to the possible conflict which might have developed had the two fisheries both operated on the same grounds at the same time.

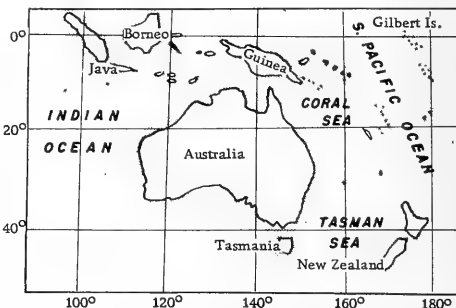
The snapper long-line season opens on April 1 and is an established fishery of long standing. The most productive months of that fishery are during April, May and September. The snapper long-line season closes at midnight on September 30.

The scallop fishery is in its first year, having begun in September 1963. Previously no restrictions have applied to the scallop fishery in Victoria. (Australian Fisheries Newsletter, May 1964.)

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### NEW SCALLOP BED SHOWS PROMISE:

East coast beds proved most productive in the opening weeks of the Tasmanian scallop season in May 1964. A new bed south of St. Helens showed most promise. Indications late in May were that the bed was more extensive than previously thought, and would attract more vessels.



About 60 vessels were expected to be dredging east coast and D'Entrecasteaux beds when

### Australia (Contd.):

the season reached its peak. This is about 40 fewer vessels than last season.

The Sea Fisheries Division of the Tasmanian Department of Agriculture reported that rough weather marred the opening of the season in the D'Entrecasteaux Channel on May 14, and only 8 vessels put to sea. Thirty-three vessels worked beds on the east coast.

Best scallop catches were in the St. Helens area where 30 to 40 bags a boat were landed. This improved to 100 bags a day for some boats in the second week of the season.

Largest and best-conditioned scallops were taken from beds off Triabunna, also on the east coast. Yields were as high as 25 to 30 pounds of meats for a bean bag containing between 550 and 700 shell scallops.

The early-season ex-vessel price for scallops was 2s.9d. (31 U.S. cents) a pound, out of which they paid 8d. (7 cents) a pound for splitting and cleaning. In April scallops were selling for 4s.4d. (48.5 cents) a pound in Hobart. Most of the early season catch was sold on the local market, and top-quality scallops were packed for export.

Tagging of 10,000 Port Phillip Bay scallops to obtain information about their growth rate, population density, mortality, and migration is planned by the Victorian Department of Fisheries and Wildlife.

Divers intend to tag in scallop beds in the Dromana, Sorrento, Portarlington, Corio Bay, Point Cook, and Mordialloc areas and a reward will be paid for returned tagged scallop shells. (Australian Fisheries Newsletter, June 1964.)

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### FISHERY EXPORTS INCREASE:

Australia is rapidly becoming one of the world's leading exporters of high-priced seafoods, and for the financial year ending June 30, 1964, it was anticipated that exports of marine products would reach A£10 million (US\$22.4 million).

For the nine months ending March 1964, exports of marine products were valued at almost £6 million (\$13.4 million) compared

with slightly more than £4.5 million (\$10.1 million) for the same period in 1962/63. Exports of marine products for the full year 1962/63 were almost £8 million (\$17.9 million).

For 1963/64 exports of spiny lobsters (both tails and whole cooked) were expected to reach £7 million (\$15.7 million) while shrimp exports were expected to approach £1 million (\$2.2 million), according to the Economic Section of the Fisheries Branch of the Department of Primary Industry.

Interesting developments have been increased exports of molluscs, mainly scallops and abalone, which could amount to £150,000 (\$336,000) for 1963/64, and the export of about 2,000 short tons of tuna. The items making up the balance of marine exports were pearls, pearl shell, whale products, and a small quantity of canned fish.

United States, France, and Japan are the three main markets for marine products. Exports to the United States for 1963/64 were expected to be about £6.3 million (\$14.1 million), consisting of approximately £6 million (\$13.4 million) of spiny lobsters, and the balance mainly tuna and shrimp. Spiny lobster exports towards the end of 1963/64 were up about 9 percent from last year. Since there was a recovery in spiny lobster prices on the United States market, the actual value of the exports could exceed the estimate.

Marine exports are now the third largest export trade item to France behind wool and hides. It is thought that for 1963/64 those exports will be worth about £900,000 (\$2.0 million), consisting almost entirely of whole spiny lobsters (approximately £750,000 or \$1.7 million) and scallops.

Japan is Australia's main market for shrimp and exports for 1963/64 should reach almost £500,000 (\$1.1 million). Pearls, and to a lesser extent pearl shell, are also sold to Japan in large quantities. (Australian Fisheries Newsletter, June 1964.)

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### NEW SOUTH WALES PLANS CHAIN OF SAFE FISHING PORTS:

To link the whole of Australia's New South Wales coastline with a chain of safe fishing ports is the ultimate aim of that State's Government. The plan also is regarded as a step

## Australia (Contd.):

towards decentralization of the fishing industry, by providing facilities for its expansion, and paving the way for the development of processing plants and the creation of local employment.

The wholesale value of the commercial fish catch in New South Wales averages between A£3.0 million and £4.0 million (US\$6.7 million and \$9.0 million) a year, and the annual catch between 25 million and 30 million pounds of fish.

To date expenditure of more than £1.3 million (\$2.9 million) has been approved on improvements to 7 fishing ports. Port works already have been completed at Bermagui, Brunswick Heads, Evans Head, and Ulladulla; work is in progress at Tweed Heads and Crowdy Head, while the building of a breakwater at Eden has been authorized.

In a number of coastal ports in the past, fishing vessels have been restricted in their operations by difficult entrance conditions and insufficient depth of water. In some cases vessels have only been able to leave port or return at high tide, and even then some times under dangerous conditions.

The State Government's plan aims to overcome those difficulties by constructing breakwaters, walls, and other associated harbor works so as to give safe entry at all stages of the tide.

The New South Wales Government also is engaged in an improvement scheme for major ports, such as Newcastle, Port Kembla, and the Clarence River mouth.

Announcing improvements to the fishing port of Eden, the New South Wales Minister for Public Works said that the greatly increased safety provided by the breakwater would encourage larger boats to operate from the port to exploit fishing grounds off the coast. "It would allow the fleet of 40 vessels to operate on a more efficient basis," he said.

Eden is one of the major New South Wales fishing ports with an annual catch worth more than £500,000 (\$1.1 million). With the development of the tuna fishery based in that port, the catch is likely to increase in value. (Australian Fisheries Newsletter, May 1964.)



## Brazil

## WHALING OPERATIONS OFF BRAZIL:

The Japanese whaling vessel Daishin Maru No. 1 is reported to be making good whale catches in the Atlantic Ocean off the Brazilian coast. The vessel, which commenced operations from a base in Brazil on June 18, 1964, is reported to have caught a total of 100 sei whales as of July 27, 1964.



The Brazilian-based whaling enterprise of another Japanese fisheries company is not conducting any whaling operations this year. (Suisan Tsushin, July 31, 1964.)



## Canada

## EXTENDED FISHING LIMITS DO NOT APPLY TO UNITED STATES FISHING VESSELS:

In July 1964, Canada proclaimed fishing limits of 12 miles as described in the Territorial Sea and Fishing Zones Act of Canada. However, the extended limits will not apply to United States fishing vessels on either the Pacific or Atlantic Coast. This means United States fishing vessels may continue to fish up to the previously established 3-mile limit of Canadian territorial waters.

Canada will also permit fishing vessels of France, Britain, Portugal, Spain, Italy, Norway, and Denmark to continue to fish in the 3-12 mile zone off Canada on the Atlantic Coast.

The exemptions for the fishing vessels of the United States and the seven European countries were established by the Canadian Government through an order in Council, the text of which follows:

"Whereas negotiations have been under way with the Governments of the United States of America, France, Britain, Portugal, Spain, Italy, Norway, and Denmark respecting fishing off Canada's coast;

## Canada (Contd.):

"And whereas the proclamation of the Territorial Sea and Fishing Zones Act will extend to areas now fished by these countries the laws of Canada respecting fishing which apply to the territorial sea of Canada;

"And whereas at the present stage of negotiations, and in order to facilitate their completion, it is expedient not to extend the application of the laws of Canada respecting fishing to areas fished by the aforementioned countries.

"Therefore, His Excellency the Governor General in Council, on the recommendation of the Minister of Fisheries, pursuant to section 4 of the Coastal Fisheries Protection Act, is pleased hereby to amend the Coastal Fisheries Protection Regulations in accordance with the Schedule hereto, effective on the day fixed by proclamation of the Governor in Council as the day on which an Act respecting the Territorial Sea and Fishing Zones of Canada, Chapter 22 of the Statutes of Canada, 1964, shall come into force.

"1. The Coastal Fisheries Protection Regulations are amended by adding thereto the following section:

"9. (1) Fishing vessels of United States of America are authorized to continue to fish in the fishing zones established by section 4 of the Territorial Sea and Fishing Zones Act.

(2) Fishing vessels of France, Britain, Portugal, Spain, Italy, Norway and Denmark are authorized to continue to fish in the fishing zones on the Atlantic Coast of Canada established by section 4 of the Territorial Sea and Fishing Zones Act."

"2. The said Regulations are further amended by deleting the words 'Canadian territorial waters' in sections 4, 5, and 6 and by substituting therefor the words 'Canadian fisheries waters'."



## Chile

FISH MEAL INDUSTRY TRENDS,  
SECOND QUARTER 1964:

All fish meal plants in northern Chile were reported to be operating in mid-1964, although the supply of anchoveta was somewhat irregular. There have been sharp fluctuations this year in landings of anchoveta, the commercial fish of the Chilean reduction industry. Anchoveta virtually disappeared off the coast of Chile in March and did not return until mid-April. (The Chilean anchoveta fleet has a limited range since the vessels must be able to deliver their catch to the fish meal plants within a day, or carry ice which is not feasible.)

Some 20 to 25 fish meal plants were operating in northern Chile in mid-1964 as the industry continued to expand. The largest plant in Chile is the new facility at Arica which has a raw material capacity of 70 tons

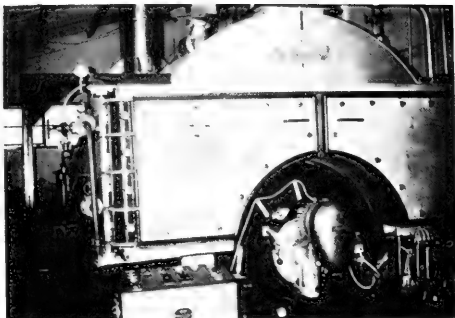


Fig. 1 - Boiler plant of a fish meal plant in San Antonio, Chile.

per hour. The new plant's capacity will be expanded to 120 tons by September 1964.



Fig. 2 - Bagging fish meal at a plant in San Antonio, Chile.

The Chilean fish meal industry is supported by a purse-seine fleet numbering close to 200 vessels. The fleet consists mainly of modern steel vessels of 100 to 170 tons, equipped with echo-sounders, radio communication, and power equipment for handling nets. The Iquique shipyard (which began operating in 1961) laid the keel for its 100th vessel in June 1964. (United States Embassy, Santiago, July 24, 1964.)



## Denmark

FISHERY PRODUCTS EXPORTS,  
JANUARY-JUNE 1964:

Exports to All Countries: Denmark's total exports of fishery products and byproducts to all countries in the first half of 1964 increased 10 percent in value over the same period in 1963, despite a 3-percent decline in quantity and a 5-percent drop in landings during the first 6 months of the year.

## Denmark (Contd.):

Danish exports of fresh fish and frozen fish—the two most important categories—increased 11 percent and 22 percent, respectively, in value. In the first half of 1964 prices were slightly better for fresh and frozen fishery products. Exports of herring fillets increased in value but those of round herring declined because of continued low prices in Germany. Danish exports of canned fish increased 13 percent in the first half of 1964, and fish oil exports tripled in value reflecting relatively high fish oil prices, but Denmark's fish meal exports dropped 10 percent.

**Exports to Economic Groups and Major Countries:** The European Common Market (EEC) accounted for 43 percent of the value of Danish fishery exports, and the European Free Trade Association (EFTA) countries took 41 percent. However, the EFTA increased its imports from Denmark by 24 percent while the EEC gained only 14 percent. Germany continued as the largest individual importer, taking 27 percent of Denmark's fishery exports. Germany's imports from Denmark of fresh and frozen herring decreased but larger imports of herring fillets, other marine fish, and pond trout added up to a total increase of 16 percent. The United Kingdom increased its imports by 32 percent, almost doubling the value of frozen fish fillets imported and also receiving greater direct landings by Danish fishing craft. Sweden and Italy increased their imports from Denmark about one-third but the United States imports dropped by 30 percent.

**Exports to the United States:** Exports of Danish fishery products to the United States declined 42 percent in quantity and 30 percent in value during the first half of 1964 as compared with the same period in 1963. A 52-percent drop in the value of United States imports of Danish cod fillets (blocks) is ascribed to competition from lower-priced Canadian fishery products in the United States market and a substantially greater demand by buyers in the United Kingdom. Denmark's inability to meet the United States market prices of Japanese trout was responsible for a 46 percent decrease in pond trout imports. Canned herring imports from Denmark were down 12 percent. However, Norway lobster imports from Denmark more than doubled and imports of Danish flatfish more than tripled.

Table 1 - Danish Fishery Products Exports to all Countries, January-June 1964 and Year 1963

Product	January-June 1964			January-Dec. 1963 <sup>1/</sup>		
	Qty.	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
<b>Fresh, Frozen, &amp; Cured:</b>						
Fresh fish	94,231	162,368	23,543	200,519	314,100	45,545
Frozen "	24,641	84,340	12,229	46,538	152,097	22,054
Salmed "	1,683	6,319	916	9,945	26,881	3,898
Smoked "	297	4,414	640	517	7,322	1,062
<b>Canned Products:</b>						
Fish	2,918	10,825	1,570	5,507	20,474	2,969
Shellfish	609	4,565	662	1,952	12,738	1,847
<b>Semipreserved Products:</b>						
Fish	695	4,158	603	1,663	9,291	1,347
Shellfish	434	2,562	372	168	2,625	380
<b>Other Products:</b>						
Fish meal, solubles, ensilage, and trout food	29,064	25,739	3,732	72,507	65,372	9,478
<b>Total . . . .</b>	<b>154,572</b>	<b>305,290</b>	<b>44,267</b>	<b>339,316</b>	<b>610,900</b>	<b>88,580</b>
	January-May 1964					
Fish oil 2/ . . .	11,015	12,994	1,877	20,754	18,607	2,698

<sup>1/</sup>Record year for quantity and value.

<sup>2/</sup>Fish oil data are shown separately because they are collected by another Ministry and often are delayed.

Note: One Danish krone equals US\$0.145.

Source: Preliminary data from Ministry of Fisheries.

Table 2 - Value of Danish Fishery Products Exports by Economic and Major Countries, January-June 1964

Destination	January-June 1964 <sup>1/</sup>		January-Dec. 1963	
	Value 1,000 Kr.	US\$ 1,000	Value 1,000 Kr.	US\$ 1,000
<b>By Economic Groups:</b>				
Common Market (EEC) . . . . .	131,000	18,995	260,000	37,700
European Free Trade Assn. (EFTA)-including Finland	126,000	18,270	225,000	32,625
East Bloc countries	12,000	1,740	30,000	4,350
Other countries	36,000	5,220	114,500	16,603
<b>Total . . . . .</b>	<b>305,000</b>	<b>44,225</b>	<b>629,500</b>	<b>91,278</b>
<b>Major Importers by Country:</b>				
West Germany	81,000	11,745	159,000	23,055
United Kingdom	58,000	8,410	109,000	15,805
Sweden	40,000	5,800	59,000	8,555
Italy	22,000	3,190	39,000	5,555
Switzerland	20,000	2,900	36,000	5,220
United States	14,000	2,030	46,500	6,743

<sup>1/</sup>Preliminary.

Table 3 - Danish Fishery Products Exports to the United States, January-June 1964

Product	January-June 1964			January-Dec. 1963		
	Qty. <sup>1/</sup>	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
<b>Fresh &amp; Frozen:</b>						
<b>Fillets:</b>						
Cod	1,811	5,702	827	8,934	27,919	4,048
Other fillets	85	370	54	769	1,283	186
Pond Trout	226	1,784	259	784	6,103	885
Flatfish <sup>2/</sup>	164	1,414	205	130	726	105
Norway Lobster	107	2,020	293	212	4,368	634
Other	1	75	10	13	141	20
<b>Cured Products:</b>						
Salted & Smoked 3/	21	77	11	105	207	30
<b>Canned Products:</b>						
Herring & sprat	269	1,282	186	556	2,977	432
Shrimp	67	664	96	175	1,654	240
Mussels	31	177	26	57	350	51
Other	10	58	8	40	227	32
<b>Semipreserved products:</b>						
Fish solubles	8	95	14	20	240	35
	100	96	14	400	344	50
<b>Total exports to U.S.</b>	<b>2,900</b>	<b>13,814</b>	<b>2,003</b>	<b>12,195</b>	<b>46,539</b>	<b>6,748</b>

<sup>1/</sup>Preliminary.

<sup>2/</sup>Mostly turbot, brill, plaice, and sole.

<sup>3/</sup>Mostly cod, salmon, eels.

Future production of Jutland cod fillets are expected to be less available to United States buyers than those from Bornholm, the Faroe Islands, and Greenland, because of the demand for local processing into consumer and institutional packs of breaded fillets, sticks and portions.

A larger production of pond trout (possibly 10 to 20 percent) is expected this fall and next year. The increase is a result of a greater survival of fingerlings due to lower loss from disease, resulting from raising the fingerlings in concrete rather than earthen ponds, and the use of dry food instead of wet food. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, July 29, 1964.)

\* \* \* \* \*

## Denmark (Contd.):

## FISHERIES TRENDS:

January-June 1964: LANDINGS: In the first half of 1964, landings in Danish ports by Danish vessels were down 12 percent from those in the same period of 1963 due mainly to a substantial decline in the catch of industrial fish. The Norway pout fishery has been a failure, and sand eel landings for the reduction industry were down about 25 percent. The decline was partly offset by heavier local landings by Danish vessels of flatfish, herring, and brisling. In addition, foreign vessels (mainly Swedish) increased their landings (mostly herring) in Danish ports. Danish vessels also increased their landings in foreign ports, which consist mainly of cod and plaice deliveries to England.

Table 1 - Danish Fishery Landings, January-June 1964 with Comparisons

Item	Jan-June 1964	Change from Jan.-June 1963	
	Quantity	Plus	Minus
	Metric Tons	.. (Percent) ..	
<b>Landings in Danish Ports:</b>			
By Danish vessels:			
Flatfish <sup>1</sup> . . . . .	32,257	11	-
Cod . . . . .	42,258	-	-
Cod-like fish <sup>2</sup> . . . . .	17,665	-	49
Herring . . . . .	117,547	37	-
Brisling . . . . .	4,071	45	-
Mackerel . . . . .	2,958	-	22
Eels . . . . .	546	-	20
Salmon . . . . .	558	-	71
Pond trout . . . . .	4,236	15	-
Other fish <sup>3</sup> . . . . .	109,110	-	39
Norway lobster . . . . .	1,015	114	-
Shrimp . . . . .	2,050	-	28
Mussel . . . . .	7,965	49	-
Other shellfish . . . . .	22	-	46
Starfish . . . . .	2,206	222	-
Total by Danish vessels in Danish ports . . . . .	344,464	-	12
By foreign vessels in Danish ports . . . . .	88,513	35	-
Total landings in Danish ports . . . . .	432,977	-	5
<b>Landings in Foreign Ports:</b>			
By Danish vessels . . . . .	2,831	95	-

<sup>1</sup>/Plaice, flounder, dab, common sole, etc.

<sup>2</sup>/Haddock, coalfish, hake, ling, etc.

<sup>3</sup>/Mostly industrial fish such as sand eels, Norway pout, etc.

PROCESSING: Danish production of processed fishery products in January-June 1964 included substantial quantities of cod filets, herring filets, plaice filets, and canned herring. Comparative production data for 1963 are not available, but export summaries indicate that more fish have been frozen, smoked, and canned in Denmark in the first half of 1964 than in the same period of 1963.

Table 2 - Danish Production of Processed Fishery Products, January-June, 1964

Product	Jan.-June 1964
	Quantity
	Metric Tons
<b>Canned:</b>	
Herring & sprats . . . . .	1,901
Mackerel . . . . .	325
Other fish . . . . .	3,011
Mussels . . . . .	258
Other shellfish . . . . .	582
<b>Semi-preserved:</b>	
Herring & sprats . . . . .	2,246
Other fish . . . . .	224
Mussels . . . . .	318
<b>Fresh &amp; Frozen Filets:</b>	
Cod . . . . .	14,138
Cod-like fish <sup>1</sup> . . . . .	758
Plaice . . . . .	7,152
Other flatfish . . . . .	486
Herring . . . . .	16,603
Other fish . . . . .	132
<b>Smoked:</b>	
Herring & sprats . . . . .	822
Mackerel . . . . .	662
Eels . . . . .	341
Salmon & trout . . . . .	222
Other fish and shellfish . . . . .	121
<b>Miscellaneous:</b>	
Force meat <sup>2</sup> . . . . .	772
Salted herring . . . . .	11
Dry-salted cod . . . . .	394
Other fishery products <sup>3</sup> . . . . .	3,790
<b>Industrial Products:</b>	
Meal . . . . .	39,582
Oil . . . . .	10,555
Enilage <sup>4</sup> . . . . .	3,018
Solubles . . . . .	4,905

<sup>1</sup>/Haddock, coalfish, hake, ling, etc.

<sup>2</sup>/Groundfish, milk, and flour.

<sup>3</sup>/Excluding industrial products.

<sup>4</sup>/Chemically treated raw fish.

July-August 1964 (Preliminary): Danish landings in July 1964 were substantial, but ex-vessel prices showed some decline. Despite a good export market, Danish processing plants were unable to handle the increased supplies because most of their workers began vacations in July.

One of Denmark's largest processing plants opened an affiliated plant in West Germany in August 1964 in order to avoid European Economic Community (EEC) tariffs on fishery products sold in the EEC countries. Initially, production at the new plant will consist of semipreserved fishery products but eventually all types of processed fishery products will be produced at the new West German facility. The greater part of the raw material for the plant will be obtained at Danish fishing ports. (Regional Fisheries Attache for Western Europe, United States Embassy, Copenhagen, August 12, 1964.)

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Denmark (Contd.):

### **FREEZERSHIP-TRAWLERS BUILT FOR SOVIET UNION:**

The M/S Geizer, the final vessel in another series of four freezer-ship-trawlers ordered by V/O Sudoimport, Moscow, from a Danish shipyard in Copenhagen, was christened on August 5, 1964. It will be the 28th freezer vessel delivered to the Soviet Union by the Copenhagen shipyard since 1932. The specifications and other particulars of the Geizer (91 meters long, 2,550 deadweight tons, and accommodations for a crew of 106) are similar to those of the Grumant, Golfstrim, and Skazachnik Andersen launched earlier in 1964.



Shows the partially completed M/S Geizer in construction drydock at a Copenhagen shipyard.

In September 1963, the Danish shipyard completed Soviet delivery of a previous series of four freezer-ship-trawlers. Four more are to be delivered in 1965. Four additional vessels for delivery by the end of 1966 were ordered from Copenhagen by the Soviets in June 1964 at a cost of about Kr.25 million (US\$3.6 million) each.

Some of the new Soviet freezer-ships operate out of Murmansk and Vladivostok off the Siberian north coast and in the northern part of the Pacific Ocean, according to Danish newspaper reports. They serve as motherships for trawlers catching cod, flatfish, and ocean perch, acting as a link in the freezer chain which ends in the Soviet retail outlets. On the freezer-ship, which also may act as a stern trawler, the catch is mechanically headed and gutted, before being packed in blocks for freezing. Mechanization has made it possible to freeze 50 metric tons of blocks per day with 4 men. The new freezer-ships also carry a fish meal plant with a daily capacity of 30 tons of raw material. Cod livers are rendered into cod-liver oil in a separate plant. The frozen fish are either taken to receiving ports by the freezer-ships or delivered at sea to transport vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 12, 1964.)

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### **TESTS INDICATE ARTIFICIAL "SEAWEED" MAY HELP PROTECT SHORELINE:**

A Danish firm has developed an artificial "seaweed" and conducted an experiment with the material in an attempt to control currents and waves, thereby protecting the shoreline. The results of that experiment attracted the interest of the Danish Maritime Board which has scheduled further tests with the artificial "seaweed."

The objective of the experiments is to retard bottom currents by the use of an artificial obstacle. The artificial "seaweed," used as the obstacle, consists of polyesterene strings which are tied together and weighted at one end. That permits the other end of the string to wave and float about in the currents, thus retarding the flow. The polyesterene string has a density of about 0.9 which gives it a tendency to float. The first experiment with the artificial "seaweed" by the manufacturing company resulted in the deposit of almost 3,000 tons of sand over a period of 12 weeks in a 1,600-square-meter area along the western coast of Jutland.

Plans called for a test by the Danish Maritime Board to begin in late July 1964 off the western coast of Jutland in an area where the Atlantic surf has been washing away the coastal area. The Maritime Board test was to take place between two concrete jetties extending



## Denmark (Contd.):

into the Atlantic Ocean. The purpose of the test is to protect the shoreline by building up sand deposits near the end of the jetties which are about 300 meters apart. Between the jetties, 10 lines of rope were to be laid about 1½ meters apart. The ropes were to be weighted and the polyesterene artificial "seaweed" was to be tied to the ropes. In the new tests, the polyesterene strings used have more resemblance to a flat ribbon than those used in the first test by the manufacturing company. It was expected that the flat ribbon design would set up more resistance to the flow along the ocean bottom.

The artificial polyesterene "seaweed" has been patented by the Danish manufacturing company which has signed agreements giving a United States oil firm an option on the patent. (United States Embassy, Copenhagen, June 24, 1964.)



## Fiji Islands

JOINT JAPANESE-BRITISH TUNA  
BASE IN FIJI ISLANDS COMPLETED:

The joint British-Japanese tuna base at Levuka, Fiji Islands, opened in early August 1964. The base is beginning operations with 17 fishing vessels, but plans to eventually increase that fleet to 26 vessels.

Shore facilities include a 2,000-ton cold-storage warehouse, a 60-ton freezing unit, a 30-ton ice-making plant, and a 600-ton ice-storage facility. Annual landings of 9,650 metric tons at the new base have been forecast, of which 6,750 tons are expected to be exported and 2,900 tons shipped back to Japan. The base has a frozen tuna export quota of 9,000 short tons. (Suisancho Nippo, August 6, 1964, and other sources.)

Note: See Commercial Fisheries Review, July 1964 p. 59, March 1964 p. 53.



## Ghana

TECHNICAL FISHERY SERVICE  
AGREEMENT MADE WITH JAPAN:

Ghana, which in February 1964 contracted to purchase ten 1,850-ton trawlers and two

1,850-ton carrier vessels from a Japanese fishing firm, in July 1964 made arrangements to receive technical fishery service from the Japanese firm for the operation of those vessels. The agreement was to be formalized when the Ghanaian Minister of Commerce and the president of the Ghanaian Fisheries Corporation visited Japan in early August. About 50 Japanese crews, including the captain and the engineer, were to board the first fishing vessel to be delivered to Ghana in August this year. The second vessel is scheduled for completion by the end of this year, the third, in June 1965, with final completion of all vessels scheduled for 1967.

Under an ambitious program to expand her fishing fleet, Ghana is also reported to have ordered a large number of fishing vessels from other countries. They include six 1,800-ton trawlers ordered from Norway, two 500-ton trawlers from Great Britain, and 18 trawlers (ten 60-ton two-boat trawlers and eight 200-ton trawlers) from the Soviet Union. Prior to this, Ghana purchased three 1,000-ton side trawlers from the Soviet Union and two stern trawlers from Great Britain, all of which are already in service. Under technical service agreements concluded with those two countries, 15 Russian crews are aboard the vessels built by the Soviet Union and 3 British nationals are serving aboard the British-built trawlers. (Suisancho Nippo, July 29, 1964.)



## Greenland

FAROEOSE FISHING RIGHTS IN GREENLAND  
WATERS TO BE RENEGOTIATED:

Faroese fishing rights in Greenland waters will be considerably reduced in 1967 unless a fishing rights agreement concluded in 1959 is renewed. In the summer of 1964, plans were announced for negotiations between the 2 countries to determine the future of the agreement.

Greenland had expected the present agreement to lead to close cooperation with Faroese fishing interests, thereby providing a supply of raw material for the developing fish-processing industry in Greenland. It was also hoped that the Faroese would train Greenland fishermen in the use of modern fishing methods. It seems, however, that those expectations have not been completely fulfilled.

It is claimed that £5 million (US\$14 million) has been invested in the development of

### Greenland (Contd.):

fish-processing plants in Greenland. Those plants are threatened with a shortage of fish. It is expected that Greenland will insist on a much larger supply of fish from Faroese fishing vessels if the present fishing agreement between the two countries is extended beyond 1967. (The Fishing News, June 26, 1964.)



### Guatemala

#### SHRIMP FISHING INVESTMENT OPPORTUNITY:

The U. S. Trade and Industrial Development Mission to Central America and Panama has described the following shrimp fishing investment opportunity in Guatemala:

A family-owned shrimp fishing enterprise, wishing to expand operations, is seeking a joint venture with United States fishing interests. The Guatemalan firm holds one of the limited number of shrimp fishing licenses issued by the Guatemalan Government. The firm wants to purchase additional vessels and build a wharf on land which it holds under long-term lease. An investment of about US\$300,000 would be required. The current net worth of the company is declared to be \$78,800. The firm's volume of business is reported to average around \$280,000 a year. In 1962, the company produced 247,000 pounds of shrimp, 88,000 pounds of fish, and 9,000 pounds of other fishery products.

For additional details write: Guillermo Matheu Bacohar, 7a Calle 9-21, Zona 1, Guatemala City, Guatemala. Correspondence should include the reference: IR 2. (International Commerce, August 17, 1964, U. S. Department of Commerce.)

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#### JOINT JAPANESE-GUATEMALAN SHRIMP OPERATIONS:

The joint Japanese-Guatemalan shrimp enterprise established at Champerico, Guatemala, is annually producing 1,000 metric tons of frozen shrimp. Most of the production is exported to the United States, principally to New York and Los Angeles, and a small portion is sold on the domestic market. Small shrimp are also exported to Japan. The joint

shrimp base, which is operating at full capacity, is said to be unable to increase production beyond the present level because of the limited capabilities of its shrimp fishing fleet.

A fleet of 30 wooden shrimp trawlers (52-72 gross tons each), equipped with high-speed engines and mechanical refrigeration, are in operation. Each trawler is jointly manned by a five-man Japanese-Guatemalan crew, with the Japanese holding positions of captain and engineer. Catch per two-week trip averages 2-3 tons, but at times runs as high as 5 tons. (Suisancho Nippo, August 14, 1964.)



### Iceland

#### SALMON FARM INVESTMENT OPPORTUNITY:

An Icelandic firm has been carrying out scientific experiments in the development of a unique crossbreed of salmon (Salmo trutta islandia). The firm is now seeking additional capital to develop commercial salmon farms. The firm, which is presently capitalized at \$35,000, plans a number of relatively small installations, rather than one large fish-rearing center, both for the accessibility of fresh water and to minimize the danger of disease in the fish. It is estimated that in about 2 years the first section of the planned installation would produce 100 tons of salmon a year, with total production gradually increasing to around 1,500 tons a year.

It is anticipated that the new breed of salmon will enjoy a good demand from institutional users in the United States and European luxury resort areas. United States firms interested in participating in the development of the salmon farms on a joint venture basis with the Icelandic firm may obtain additional information by writing to the Bureau of International Commerce, Office of International Investment, File 5-0989-1-S, U. S. Department of Commerce, Washington, D. C. 20230.

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#### FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-MARCH 1964:

Species	January-March	
	1964	1963
	..... (Metric Tons) .....	
Cod .....	88,607	71,530
Haddock .....	17,828	16,590
Saithe .....	8,330	3,166

(Table continued on next page.)

## Iceland (Contd.):

Species	January-March	
	1964	1963
	... (Metric Tons) ...	
Ling	2,249	2,784
Wolfish (catfish)	3,360	6,329
Cusk	2,346	3,535
Ocean perch	3,507	3,987
Halibut	240	284
Herring	64,366	62,420
Shrimp	45	291
Capelin	8,640	-
Other	1,133	1,305
Total	200,651	172,221

Note: Except for herring which are landed round, all fish are drawn weight.

\* \* \* \* \*

UTILIZATION OF FISHERY LANDINGS,  
JANUARY-MARCH 1964:

How Utilized	January-March	
	1964	1963
	... (Metric Tons) ...	
Herring <sup>1/</sup> for:		
Oil and meal	51,707	43,812
Freezing	9,428	9,059
Salting	3,231	4,646
Fresh on ice	-	4,904
Groundfish <sup>2/</sup> for:		
Fresh on ice	11,744	11,417
Freezing and filleting	54,793	52,401
Salting	31,193	20,982
Stockfish (dried unsalted)	25,594	20,165
Canning	24	-
Home consumption	3,231	3,767
Oil and meal	1,021	778
Capelin for:		
Freezing	133	-
Oil and meal	8,507	-
Shrimp for:		
Freezing	20	267
Canning	25	23
Total production	200,651	172,221

1/Whole fish.

2/Drawn fish.

Source: Aeqir, June 15, 1964.



## India

JOINT JAPANESE-INDIAN FISHING FIRM  
CONCENTRATES ON SHRIMP:

A joint fishing venture established in India almost 10 years ago by a large Japanese fishing company and an Indian firm is reported to be directing its main effort to shrimp fishing. Initially, the base commenced operations as a trawling base for bottomfish such as red snapper, croaker, and Spanish mackerel, but several years ago it began to concentrate on shrimp fishing following the discovery of good shrimp grounds off Cochin.

Seven shrimp trawlers (from 15 to 75 gross tons) are operating out of that base. Production per vessel reportedly runs as high as 500 boxes (33 lbs. per box) per day. Large shrimp are mostly frozen and exported to the United States, Europe, and Japan. The joint firm is planning on adding 10 shrimp trawlers to its fishing fleet.

Trawl operations for bottomfish are being conducted with the company's two-boat trawler based at Bombay. The vessel is manned jointly by Japanese and Indian crewmen. (Nihon Suisan Shimbun, August 10, 1964.)



## Italy

JAPANESE FROZEN TUNA SALES  
TO ITALY IMPROVING:

Japanese frozen tuna sales to Italy, which had sharply declined in the second quarter of 1964, were reported improving as of late July, with active offers being made by Italian packers. Tuna packing in Italy, which had been partly reduced or completely suspended due to the unfavorable foreign exchange situation in that country, was back in full swing at most of the plants as a result of large canned tuna orders placed by the Italian armed forces. Italian offers for Japanese tuna were being made at US\$300 a metric ton for yellowfin and US\$275 a metric ton for big-eyed, c.i.f. Italy. (Nihon Suisan Shimbun, July 24, 1964.)

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JOINT JAPANESE-ITALIAN  
TUNA VENTURE:

A Japanese fishing company in July 1964 was authorized by the Japanese Fisheries Agency to participate in a proposed joint tuna venture with an Italian firm. The Japanese firm is to contribute the equivalent of 30 million yen (US\$83,333) of the total capital investment of 100 million lire (US\$160,000) for the enterprise, which will be established in Italy. The venture includes the operation of a 1,500-ton two-portable boat-carrying tuna mother-ship, to be built in Italy. However, since the vessel construction has not yet been started, it appears likely that this venture will not go into full-scale operation until the summer of 1965.

The Japanese firm will conduct the fishing operations and the Italian partners will sell

## Italy (Contd.):

the catches to Italian packers. Annual production of tuna is expected to total around 2,000 metric tons. (Suisancho Nippo, July 29, 1964)

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**MARINE OIL FOREIGN TRADE, 1962-1963:**

Italy's foreign trade in marine oils in 1962 and 1963 consisted almost entirely of incoming shipments as exports were insignificant. Italian imports of marine oils (other than liver oils) in 1963 were down 16.5 percent from those in the previous year due mainly to a sharp drop in shipments from the Netherlands. Italian imports of marine liver oils

Italy's Foreign Trade in Marine Oils, 1962-1963				
Commodity and Country of Origin or Destination	Imports		Exports	
	1963	1962	1/1963	1962
	..... (Metric Tons) .....			
<b>Marine Fats and Oils</b>				
(other than liver oils):				
Finland .....	-	50	-	-
France .....	1,079	1,494	-	-
West Germany .....	116	105	-	-
Norway .....	4,432	4,441	-	-
Netherlands .....	626	2,298	-	-
Portugal .....	706	739	-	-
United Kingdom .....	255	183	-	-
Morocco .....	1,947	1,526	-	-
South Africa Republic .....	6	55	-	-
Canada .....	297	-	-	-
Peru .....	114	125	-	-
United States .....	163	-	-	-
Other countries .....	121	796	13	17
<b>Total marine fats and oils (other than liver oils)</b>	<b>9,862</b>	<b>11,812</b>	<b>13</b>	<b>17</b>
<b>Marine Liver Oils:</b>				
Finland .....	19	-	-	-
France .....	43	3	-	-
West Germany .....	58	26	-	-
Iceland .....	22	39	-	-
Norway .....	607	526	-	-
Portugal .....	491	618	-	-
United Kingdom .....	198	117	-	-
Other countries .....	40	36	1	2
<b>Total marine liver oils</b>	<b>1,478</b>	<b>1,365</b>	<b>1</b>	<b>2</b>

1/Export data for 1963 limited to January-October period.

in 1963 showed a modest gain from the previous year. (United States Embassy, Rome, April 13, 1964.)

**Ivory Coast****PLANS FOR FISHERY DEVELOPMENT:**

Developments and plans for expansion of the commercial fisheries of the Ivory Coast were outlined in a feature article titled "Im-

portant Expansion of Industrial Fishing Planned to Satisfy Growing Demand for Fish," published this past summer in Abidjan's local daily newspaper Matin. A translation of the article follows:

"As a result of technical development, traditional fishing is being replaced more and more by industrial fishing. This is a result of progress and wealth. A great change has taken place from the pirogues to fishing boats, who now go fishing with a maximum of safety. Without these new techniques, it would be impossible to venture to the offshore fishing banks, since fishing is more or less hazardous. Fish are seldom seen during the rainy season; the temperature is too low at the surface of the sea, pushing the fish to the deeper water.

"Fishing will become an important industry in the future. The Director of the Fishing Port released the following information about the development of industrial fishing in the Ivory Coast, the creation of an Ivoirien fishing fleet being the objective:

"**Fishing Boats and Production:** There are now 67 fishing boats in Abidjan. Production in 1963 was between 30,000 and 35,000 tons, valued at 45 CFA per kilo on the dock (approx. 8.2 U.S. cents per pound), or a total value on the dock of 1,350,000,000 to 1,575,000,000 CFA (approx. US\$5.4 million to 6.3 million). To this must be added production from the traditional fishery of 15,000 tons of a value of 675,000,000 CFA (US\$2.7 million).

"**Projects:** 1. Modernization of the fishing fleet.

"2. Creation of a joint company; The 'Fonded' Aide et de Cooperation' (FAC) will finance 300,000,000 CFA (US\$1.2 million).

"3. Construction of three fishing vessels for sardine and tuna to be equipped for freezing.

"Two private companies have already bought fishing vessels equipped for freezing. They will fish in the high seas, using the new 'pelagic trawl' and the purse seine for tuna. The 'pelagic trawl' will protect the deep-sea life.

"**Traditional Fishing:** For the small fishermen, some 10-ton fishing vessels built locally and equipped with Diesel engines will replace the motorized pirogues. These boats can be operated by Ivoirien fishermen with

## Ivory Coast (Contd.):

little training and are not too expensive (3 to 4 million CFA) (approx. US\$12,000 to \$16,000).

"The Fishing Service of the Ivory Coast will get another fishing vessel for sardine and tuna, equipped with freezing facilities, and some fishermen will be trained on board as has been done before on the Reine-Pokou.

"Research Must be Directed to the Migrating Banks: The research directed to the migrating banks will provide continuous knowledge of the best fishing areas and the catching methods to be used.

"Construction of a Cold Storage: The fish market is very irregular in the Ivory Coast, and trade is very difficult. The Ivoirien Government has decided on the construction of a large cold-storage plant to help to stabilize the price of fish. The characteristics of the cold-storage are: 50 tons of ice per day; 400 tons of storage capacity at 0° C. (32° F.); 60 tons of freezing capacity; 1,500 to 3,000 tons of storage capacity at -20° C. (-40° F.); and 350 tons of fresh frozen food at less than -20° C.

"Expansion of Fish Distribution Facilities: This new cold-storage plant is the first step of a commercial fish distribution system for all of the Ivory Coast and the Upper Volta. At the end of this year the company 'Franco-Ivoirienne,' equipped with a freezer vessel of 55 meters (about 170 feet) in length, will produce 300 to 400 tons of fish monthly, frozen and packed in 23-kilogram cartons about 50 pounds. These will be sold locally and also delivered by trucks or by rail to the principal cities of the Ivory Coast.

"A Smoke-Curing City Fish Factories: Smoke-curing is in the long run the cheapest method of preservation. A project of a 'City of Smoke-Curing' is being studied. It will include 500 smoke-curing facilities and an area on which workers' housing will be built.

"There are already two tuna canneries which produce 40 tons of products daily. A project calling for a factory of 50 tons daily capacity will be realized soon. This plant will produce fish meal for human consumption and for animal consumption, and fish oils for industrial uses.

"At last we can say that the fishing industry in the Ivory Coast will see very important developments in the near future."

The United States fishery observer in Abidjan reports that most of the plans described in the article are proceeding. The new "Port de Peche" (Fishing Port) had been open for several months for unloading purposes, and construction of the cold-storage plant was about 25 percent completed. The vessel for the Fishing Service referred to in the article is the research and training vessel provided by the U. S. Agency for International Development which was expected to be delivered in a few months.

According to local Ivory Coast reports, the beginning of a fish distribution system as described in the article should take place in the fall of 1964, probably using the existing railroad (with terminus at Ouagadougou, Upper Volta) as the first means of transportation, with refrigerated trucks to come later. The two factories mentioned are the two small tuna canneries now existing (one cans pineapple in season and tuna when plentiful). Plans for a larger tuna cannery at the new "Port de Peche" are on paper, but are probably a little further away in actual realization than the other developments. (Fisheries Attache, United States Embassy, Abidjan, August 18, 1964.)

Note: See Commercial Fisheries Review, September 1964 p. 70.



## Japan

## EXPORT VALIDATIONS FOR FROZEN TUNA AND TUNA LOINS TO U.S.

January-July 1963-64: Japan's export validations of frozen tuna and cooked frozen tuna loins to the United States during January-July 1964 totaled 63,329 short tons, an increase of 21,267 short tons (50 percent) as compared with exports during the same period in 1963. Albacore exports increased 90 percent, yellowfin 18 percent, skipjack 18 percent, and tuna loins 68 percent. Exports of big-eyed tuna declined 13 percent. Only 1 short ton of bluefin tuna was exported during the period, compared with 374 short tons exported in 1963.

Japanese tuna industry sources attribute the heavier than normal frozen tuna exports to the United States for the first six months in 1964 as compared with last year's shipments during this period to: (1) good supplies of summer albacore caught off the coast of Japan, and (2) lack of demand for tuna by the Japanese tuna canning industry because of the

## Japan (Contd.):

Japan's Export Validations for Frozen Tuna and Tuna Loins to U.S., Jan.-July 1963-64							
Species	Direct	1964 Trans-shipped	Total	Direct	1963 Trans-shipped	Total	Total Exports 1963
(Short Tons).							
Albacore, round	15,649	18,233	33,882	4,424	13,382	17,806	36,737
Yellowfin:							
Round	-	616	616	-	463	463	-
Gilled & Gutted: 20/100 lbs. up	14,761	2,182	16,943	11,312	3,248	14,560	-
Drad. with tail	1,517	-	1,517	164	-	164	-
Fillets	25	2,776	2,801	-	3,062	3,062	-
Total	33	12	45	195	96	291	-
Big-eyed:							
Gilled & gutted	30	30	60	20	4	24	-
Drad. with tail	170	-	170	-	240	240	-
Fillets	37	3	40	6	42	48	-
Total	67	203	270	26	286	312	316
Bluefin fillets	-	1	1	-	374	374	374
Skipjack, round	8	2,800	2,808	70	2,312	2,382	3,762
Loins:							
Albacore	2,117	-	2,117	1,111	-	1,111	2,998
Yellowfin	2,329	-	2,329	1,537	-	1,537	3,083
Bluefin	-	-	-	-	-	-	157
Total	4,446	-	4,446	2,648	-	2,648	6,238
Grand total	36,506	26,823	63,329	16,838	23,223	42,062	180,797

D/Revised.

sluggish market in the United States for tuna canned in brine. Direct shipments of round albacore increased from 4,424 short tons during January-July 1963 to 15,649 short tons in 1964, an increase of 254 percent; direct shipments of yellowfin increased 40 percent. Frozen tuna validated for export during January-July 1964 amounted to 78 percent of the total exported for the entire year in 1963. (Fisheries Attache, United States Embassy, Tokyo, August 19, 1964.)

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January-June 1963-64: Japan's export validations of frozen tuna and cooked frozen tuna loins to the United States during January-June 1964 totaled 48,434 short tons, an increase of 28 percent as compared with 37,948 short tons for the same period in 1963. Of the total shipments of 48,434 tons authorized to be shipped during that period in 1964, albacore amounted to 23,423 tons or 48 percent, yellowfin 18,398 tons or 38 percent, skipjack 2,781 tons or 6 percent, and tuna loins 3,710 tons or 8 percent. The shipment of big-eyed tuna authorized was very small.

In January-June 1963, the percentage exported by species was: albacore 42 percent,

Japan's Export Validations for Frozen Tuna and Tuna Loins to U.S., June 1964 and January-June 1963-64											
Species	June 1964			Jan.-June 1964			Jan.-June 1963			Total	
	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped
(Short Tons).											
Albacore:											
Round	1,424	1,468	2,890	10,224	13,199	23,423	4,129	11,970	16,099		
Yellowfin:											
Round	-	78	78	-	606	606	-	455	455		
Gilled & Gutted: 20/100 lbs. up	3,400	80	3,480	12,119	1,996	14,115	10,332	2,392	12,724		
Drad. with tail	284	-	284	1,281	-	1,281	164	-	164		
Fillets	18	209	227	25	2,335	2,360	2,819	2,919	5,738		
Total	3,702	387	4,089	13,458	4,940	18,398	10,691	5,859	16,550		
Big-eyed:											
Gilled & gutted	-	-	-	-	5	5	20	4	24		
Drad. with tail	-	55	55	-	79	79	6	36	42		
Fillets	30	1	31	37	1	38	6	36	42		
Total	30	56	86	37	85	122	26	239	265		
Bluefin	-	-	-	-	-	-	-	374	374		
Skipjack:											
Round	-	909	909	8	2,773	2,781	70	2,312	2,382		
Loins:											
Albacore	415	-	415	1,854	-	1,854	881	-	881		
Yellowfin	416	-	416	1,856	-	1,856	1,397	-	1,397		
Total	831	-	831	3,710	-	3,710	2,278	-	2,278		
Grand total	5,887	2,798	8,685	27,437	20,997	48,434	17,194	20,754	37,948		

Source: Japan Frozen Food Export Association.

yellowfin 44 percent, skipjack 6 percent, and tuna loins 6 percent. Shipments of bluefin and big-eyed were very small. (Fisheries Attache, United States Embassy, Tokyo, July 27, 1964.)

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ATLANTIC TUNA EXPORTS,  
JANUARY-JUNE 1964:

Japanese Atlantic-caught tuna exports approved by the Japan Export Frozen Tuna Producers Association during January-June 1964 are shown in the table. Transshipments of Atlantic tuna to the United States during that period totaled 19,887 short tons and exports

Table 1 - Atlantic Frozen Tuna Transshipments to the United States, January-June 1964 with Comparisons									
Species	Year	Jan.	Feb.	Mar.	April	May	June	Total	
(Short Tons)									
Albacore	1964	2,689	4,048	3,130	598	948	1,649	13,062	
	1963	3,502	3,725	2,467	1,678	265	162	11,799	
Yellowfin	1964	1,260	663	869	868	323	867	4,850	
	1963	564	705	1,085	1,731	1,209	50	5,344	
Big-eyed	1964	-	-	-	3	-	2	86	
	1963	59	22	19	77	43	-	220	
Bluefin	1964	-	-	-	-	-	21	21	
	1963	98	-	3	213	67	-	381	
Skipjack	1964	184	153	86	315	590	540	1,868	
	1963	193	301	261	592	129	-	1,476	
Total	1964	4,133	4,864	4,088	1,781	1,863	3,158	19,887	
	1963	4,416	4,753	3,835	4,291	1,713	212	19,220	

## Japan (Contd.):

Table 2 - Atlantic Frozen Tuna Exports to Italy, January-June 1964 with Comparisons									
Species	Year	Jan.	Feb.	Mar.	April	May	June	Total	
		. . . (Metric Tons) . . . . .							
Albacore	1964	60	37	18	13	24	65	217	
	1963	267	-	114	353	57	141	932	
Yellowfin	1964	2,059	1,282	1,134	1,615	1,305	1,253	8,648	
	1963	668	135	577	3,653	3,990	1,904	10,927	
Big-eyed	1964	650	200	134	250	298	437	1,969	
	1963	530	243	216	628	735	645	2,997	
Bluefin	1964	321	55	-	363	488	846	2,073	
	1963	428	11	4	578	718	907	2,646	
Skipjack	1964	-	-	-	16	-	-	16	
	1963	-	-	-	-	-	-	-	
Total	1964	3,090	1,574	1,286	2,257	2,115	2,601	12,923	
	1963	1,893	389	911	5,212	5,500	3,597	17,502	

Table 3 - Atlantic Frozen Tuna Exports to Other European & African Countries, January-June 1964 with Comparisons		
Country of Destination	Quantity	
	1964	1963
	. (Metric Tons) .	
Yugoslavia . . . . .	7,124	6,109
Other European & African Countries . . . . .	4,936	1/

1/Quantity omitted due to misprint in the original Japanese article.

to Europe and Africa amounted to 24,983 metric tons. (Suisan Nippo, July 10, 1964.)

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# TUNA CANNERS AND EXPORTERS DISCUSS DROP IN EXPORTS OF CANNED TUNA TO U. S.:

The Japan Export Tuna Packers Association on August 12, 1964, held its fifth meeting to deliberate on ways and means of overcoming the slow movement of Japanese canned tuna in brine exports to the United States. At that meeting, the Association directors agreed to sell to exporters 900,000 cases of canned tuna in brine during the remainder of the business year (December 1963-November 1964)--450,000 cases during August and September, and 450,000 cases during October and November. Prices were to be determined at the board of directors meeting. In an effort to stimulate exports to assure attainment of that target, the directors agreed to have the Canned Tuna Sales Company (representing can-

ners) conduct sales directly with the 18 outlet firms belonging to the Canned Foods Exporters Association, instead of selling to the Association, which is the procedure normally used.

Opinions within the Japan Foods Exporters Association on this latest canners' offer were divided, one group favoring the idea and the other opposing it to the extent of even urging that the exporters torpedo the packers' plan. On August 14, the Tuna Subcommittee of the Exporters Association formed a countermeasures committee to study the canners' new sales plan since it felt that direct dealings between packers and exporters may create undue competition among exporters and may even disrupt market conditions. The countermeasures committee met on August 17 and 18, but the details of the meeting were not disclosed. However, it seems likely that the Association will go along with the canners' offer of the 900,000 cases planned for export during the remainder of the business year.

Meanwhile, the Exporters Association agreed to provisionally export 35,000 cases of lightmeat tuna in brine packed in 4-lb. cans (6 cans to case). That shipment is part of the 80,000 cases of lightmeat tuna that had been scheduled for sale in July. Sales of the balance of 45,000 cases (7-oz. 48's and 13-oz. 24's) were being withheld pending conclusion of a price agreement with the canners. (Suisan Tsushin, August 12, 15, & 19; Suisan Keizai Shimbun, August 14, 1964.)

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# REDUCTIONS PROPOSED FOR CANNED TUNA EXPORT QUOTA AND PRICES:

At a meeting between the Japan Canned Foods Exporters Association and the Japan Tuna Packers Association at Shimizu, Japan, in late July, the chairman of the Exporters Association's Tuna Committee proposed that the canned tuna export quota and packers' prices be reduced. In his proposals, which he described as his "personal suggestions," he stated that the 2.5-million-case export quota canned tuna in brine for the United States market during the current business year (December 1963-November 1964) was difficult to fulfill and that a more realistic export target would be 2 million cases. In this case, Japanese exporters would have to sell 925,000 cases to the United States during the remaining five months from July to November. By type of pack, he suggested that 585,000 cases of whitemeat tuna and 340,000 cases of light-

Japan (Contd.):

meat tuna should be sold and advised that no substitution should be made in case a supply shortage occurs in either type of pack.

Regarding canned tuna prices, he pointed out the need to substantially reduce prices in view of the present market situation in the United States. For whitemeat tuna he felt that the packers may have to continue granting the \$1 promotional allowance per case for the time being because of the large inventory the packers were carrying, which would preclude a price reduction at this time. But he urged the packers to reduce the canned lightmeat tuna prices by \$1 a case for No. 1 (7-oz.) 48's and by 50 cents a case for 4-lb. (66-oz.) 6's. (Minato Shimbun, August 1, 1964.)

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#### SLOW SALES OF CANNED TUNA STUDIED BY JAPANESE PACKERS AND EXPORTERS:

Japanese tuna packers and exporters as of mid-July 1964, stated that Japanese canned tuna in brine exports to the United States were said to have reached a turning point, demanding drastic changes to cope with the slow export trade. Canned tuna sales transacted for export to the United States up to and including the sixth sale totaled 1,080,000 cases (850,000 cases of white meat tuna and 230,000 cases of light meat tuna). At that rate of sales, Japanese packers and exporters see little prospects of attaining the 2.5-million-case quota established for export to the United States during the current business year (December 1963-November 1964) and are even uncertain that 1.7 million or 1.8 million cases could be exported by the end of the business year (November).

Japanese tuna packers attribute the slow movement of Japanese products on the United States market to the extensive advertising by United States packers, as well as to the problem of Japanese canned tuna prices. Japanese packing industry representatives who toured the United States observed that major United States packers were conducting extensive promotional sales to boost sales.

Japanese canned tuna in brine as of July 1964 were exported at f.o.b. Japan prices of US\$10.50 a case for whitemeat tuna and \$7.60 a case for light meat tuna. In the case of whitemeat tuna, the additional costs of freight, insurance, and broker's commission would in-

crease the United States delivered price to \$13.50 a case. In comparison, main United States brands of canned tuna were reported to be selling for \$13-14 a case, private or other packers' labels for around \$11 a case. (Suisancho Nippo, July 20; Suisan Keizai Shimbun, July 19, 1964.)

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#### CANNED-TUNA-IN-OIL EXPORT PRICES TO CANADA, 1964:

The Japan Canned Tuna Export Association set the following ex-warehouse and f.o.b. prices for canned tuna in oil for export to Canada in 1964. Export of canned tuna in oil in can sizes other than those shown will be considered by the Association when the need arises. (Fisheries Attache, United States Embassy, Tokyo, July 15, 1964.)

Japan's Export Prices for Canned Tuna in Oil to Canada, 1964				
Category	Can Size	Price Per Case		
		Ex-Warehouse Japan/		F.o.b. Yokohama
		Yen	US\$	US\$
White meat (solid)	No. 1 (13-oz.)/24's	2,780	7.66	8.30
	No. 2 (7-oz.)/48's	3,050	8.40	9.15
	No. 3 (3-1/2-oz.)/48's	1,750	4.82	5.35
	2 kilos (4.4 lbs.)/6's	3,240	8.93	9.65
White meat (chunk)	No. 1 (13-oz.)/24's	2,610	7.19	7.80
	No. 2 (7-oz.)/48's	2,880	7.93	8.65
	No. 3 (3-1/2-oz.)/48's	1,650	4.55	5.05
	2 kilos (4.4 lbs.)/6's	3,050	8.40	9.10
(flake)	No. 2 (7-oz.)/48's	2,210	6.09	6.70
Light meat (solid)	No. 1 (13-oz.)/24's	2,267	6.25	6.80
	No. 2 (7-oz.)/48's	2,432	6.75	7.40
	No. 3 (3-1/2-oz.)/48's	1,431	3.94	4.40
	2 kilos (4.4 lbs.)/6's	2,643	7.28	7.90
Light meat (chunk)	No. 1 (13-oz.)/24's	2,090	5.76	6.30
	No. 2 (7-oz.)/48's	2,270	6.25	6.90
	No. 3 (3-1/2-oz.)/48's	1,320	3.64	4.10
	2 kilos (4.4 lbs.)/6's	2,450	6.75	7.35
(flake)	No. 2 (7-oz.)/48's	1,969	5.42	6.00

1/Ex-warehouse price does not include brokerage, shipping, labeling, or packing.

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#### ALBACORE TUNA CATCH IN ATLANTIC IMPROVING:

More than half of the some 150 Japanese tuna vessels operating in the Atlantic Ocean this past summer were reported to be fishing off the South American coast, where albacore catches were said to be relatively good. Landings in that area were running about 70 percent albacore, 10-20 percent bluefin and big-eyed and less than 10 percent yellowfin. The preponderance of albacore landings is said to have created a favorable condition for tuna exports to the United States, and for that reason Japanese tuna exporters were closely watching albacore price developments in the



## Japan (Contd.):

United States market, particularly since albacore export prices were said to be \$10-15 below the earlier trading price of US\$335 a short ton, f.o.b. Port of Spain. (Suisan Tsushin, July 16, 1964.)

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# JAPANESE GOVERNMENT TO EXPLORE FOR ATLANTIC TUNA:

The Japanese Fisheries Agency is planning to charter the Fukushima prefecture-operated fishery guidance vessel Joban Maru (475 gross tons) to conduct tuna explorations in the Atlantic Ocean. The vessel was scheduled to depart Japan in early October 1964 on a two-months cruise to explore the waters fished by Japanese long-liners. The research objective of the vessel is to collect data on current, water and atmospheric temperatures, and other oceanographic conditions, as well as hook rates. Stations will be occupied on the lines connecting the points 27° W. longitude-20° N. latitude and 27° W. longitude-25° S. latitude, and the lines connecting the points 10° W. longitude-3° N. latitude and 10° W. longitude-25° S. latitude. (Minato Shimbun, July 24, 1964.)

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# ATLANTIC TUNA FISHERY TRENDS, 1957-1964:

Available catch statistics show that the total Atlantic tuna catch by all countries amounted to less than 100,000 metric tons in 1957; however, by 1963 the catch had increased to

nearly 200,000 tons. The increase was due mainly to an expansion of the Japanese Atlantic long-line fishery.

Japan's Atlantic tuna catch increased rapidly from 1957 (15,885 tons) to 1961 (82,251 tons), and then declined to 60,369 tons in 1962 despite increased fishing effort. The decline in 1962 was due mainly to a poor catch of yellowfin (down from 52,631 tons in 1961 to 26,857 tons in 1962). Japan's 1963 Atlantic tuna catch was reported in trade journals to total about 93,000 metric tons.

Estimates indicate Japan is now taking about half of the total Atlantic tuna harvest. The Japanese Atlantic tuna fleet increased from 26 vessels in 1957 to a reported 127 vessels in 1963 and an estimated 150-160 vessels in 1964. That increase, which showed particularly sharp acceleration in 1963 and in 1964, was due in large part to poor tuna fishing conditions in the South Pacific and Eastern Pacific, resulting in a shift of Japanese vessels to the Atlantic.

Japanese tuna fishing capability in the Atlantic in 1964 has been further developed by the establishment of two overseas fishing bases (Cape Verde Islands off the west African coast of Senegal, and St. Martin, Netherlands Antilles, in the Caribbean Sea).

Those developments mean that the Japanese catch (assuming "normal" fishing conditions) can likely be expected to increase by at least 10,000 metric tons in 1964.

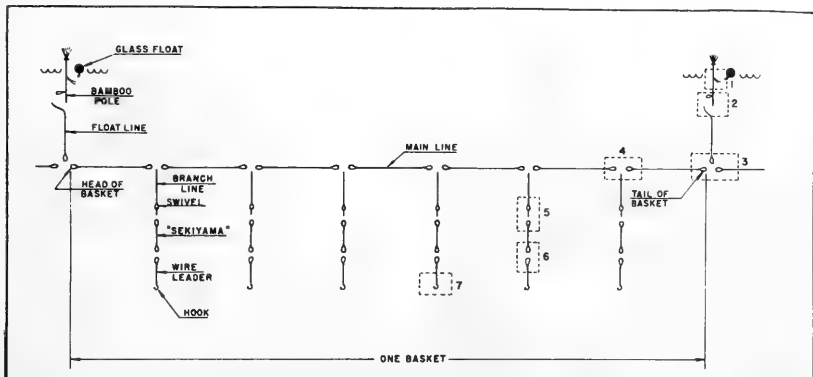


Diagram showing the component parts of a basket of tuna long-line fishing gear. Insets illustrate knots that are generally used in assembling the different sections.

## Japan (Contd.):

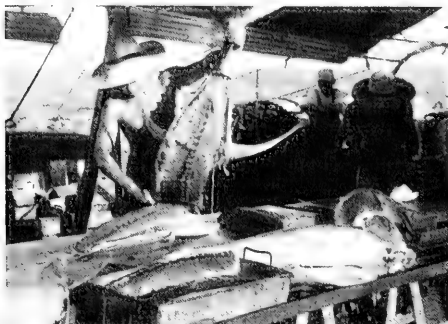
The growing Soviet interest in tuna fishing may have significance for the Atlantic fishery. The U.S.S.R. is already engaged in experimental tuna fishing in the Indian Ocean and, according to press reports, has ordered five large tuna factoryships from Japan. The first of those factoryships, Leninsk Luch (5,100 gross tons), which will carry six 20-ton portable boats, was launched in Japan in January 1964. A second vessel is expected to become operational in fall 1964. The specific ocean assignment of those tuna factoryships, which likely will use long-line gear, are unknown. However, Soviet trawlers operating off the Atlantic coast are reported to be observing the fishing techniques and operations of United States tuna purse-seine vessels.

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#### TUNA MOTHERSHIP FISHING TRENDS IN THE SOUTH PACIFIC:

A Japanese fishing company is planning on sending the tuna mothership Shinyo Maru (2,900 gross tons) to the South Pacific. The Shinyo Maru fleet, which has been assigned a production target of 5,000 metric tons, will operate in the vicinity of the Fiji Islands from October 1, 1964, until sometime in February 1965. During that period of the year, catch rates usually decline, so a larger number of catcher vessels will be assigned to the Shinyo Maru this year to assure a profitable trip. For a financially successful operation, it is said that each catcher vessel will have to land an average of 2.3 tons of fish per day.

The tuna mothership Yuyo Maru (5,040 gross tons) as of July 1964 was operating in



A worker filleting a yellowfin tuna aboard a Japanese tuna mothership.

the South Pacific off the Fiji Islands with good results. More than half of the 55 catcher vessels serving the Yuyo Maru were landing an average of at least 2.2 tons per day, 7 or 8 catcher vessels were averaging over 3 tons, and several were landing over 4 tons in 1 day. The catch was said to be predominantly yellowfin tuna. The Yuyo Maru expected to fulfill her production target of 5,300 tons by the scheduled withdrawal date of September 25, 1964. (Suisancho Nippo, August 1, 1964.)

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#### GOOD TUNA LANDINGS AT CAPE VERDE BASE OFF WEST AFRICAN COAST:

Good tuna landings have been reported at Sao Vicente, Cape Verde Islands, where a storage and transshipment base was established in June 1964 by Japanese, Portuguese, and United States interests. A total of 993 tons of tuna were unloaded at the base during the period June 4-July 6, 1964, by six fishing vessels. Of that amount, over 700 tons were contracted for delivery to a Puerto Rican packing plant owned by the United States partners, about 250 tons were shipped to Japan, and a small quantity exported to Italy.

The Cape Verde Islands tuna base is being served by 10 fishing vessels, and there are plans to increase that fleet to 25 vessels in 1964. The base has a cold-storage capacity of 700 tons, which will be increased to 1,800 tons upon completion of the refrigeration plant now under construction. (Suisan Tsushin, July 31, 1964.)

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#### TUNA RESEARCH COUNCIL TO BE FORMED:

The Japan Fisheries Resource Conservation Society is planning to form, within its organization, a tuna research group to be tentatively named the Tuna Resource Research Council. The Council, which will consist of 20 persons representing the Government, industry, and scientific community, will conduct independent research on tuna resources for the purpose of better understanding the true state of the Japanese fishing industry. It will also assist industry in solving problems related to fishery resources. Its activities will be financed initially with funds obtained by assessing additional fees to members of the Fisheries Resource Conservation Society. (Suisancho Nippo, August 7, 1964.)

Japan (Contd.):

#### TWO NEW TUNA PURSE SEINERS ON TRIAL RUNS:

Two Japanese newly-built purse seiners (Kuroshio Maru Nos. 81 and 82, each of 140 gross tons) were undergoing trial runs off northeastern Japan in August 1964 in preparation for mothership-type purse-seine operations in the Atlantic Ocean. They were scheduled to depart Japan for West African waters in early September to fish (primarily for skipjack) off the coasts of Sierra Leone, Ivory Coast, and Ghana for a period of two years. Catches will be delivered to the bases of United States tuna-canning firms in West Africa. The Japanese firm owning the seiners plans to operate the freezer ship Chichibu Maru No. 2 (1,700 gross tons) as the mothership. (Suisancho Nippo, August 18, 1964.)

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#### JAPANESE TUNA MOTHERSHIP CREW DISMISSED FOR DISTURBANCE ABOARD:

All crew members, including the skipper, of the Japanese tuna mothership Showa Maru No. 1 (1,076 gross tons) were dismissed by the vessel owner. The vessel returned to Japan on June 25, 1964, one month earlier than scheduled, due to a disturbance aboard the vessel. The dismissal was on the grounds of neglect of duty.

Investigation by the vessel's owner revealed that the disturbance was caused not by the crew members' dissatisfaction over wages, as had been originally suspected, but by acts of violence committed by some unruly crewmembers. Those led to the deterioration of discipline on the vessel. (Suisan Keizai Shim-bun, July 11, 1964.)

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#### JAPAN BUYS SALMON FROM ALASKA:

According to Japanese press reports, the sale of Prince William Sound salmon to Japan (as proposed by Alaskan Governor Egan on July 15, 1964), was negotiated this past summer with four Japanese fishing firms. The Alaskan salmon purchase by those four firms was approved by the Japanese Fisheries Agency on July 18 after a careful study was conducted by the Agency to make certain that the sale did not conflict with the Tripartite Fisheries Treaty (North Pacific Fisheries Convention) and that it would not disrupt the Japanese domestic market.

The four Japanese fishing firms made arrangements to dispatch refrigerated vessels to Prince William Sound to receive the catches for shipment back to Japan.

The quantity of salmon involved was 9,000-10,000 short tons. Evidently, this quantity was the basis on which the Japanese firms decided to dispatch 8 vessels with a total holding capacity of close to 11,000 tons.

Purchase prices agreed upon between the Alaska Fishermen's Union and Japanese buyers were 10.5¢ a pound for pink salmon and 8.5¢ a pound for chum salmon. Japanese buyers were also to pay the Alaskan State tax of 1.6¢ per fish and, in addition, transportation charges



The Japanese refrigerated vessel Akebono Maru No. 71 (a new vessel on its maiden voyage) docked at Cordova, Alaska, before moving out to buy salmon from United States fishermen in the Prince William Sound area. Of 1,470 gross tons, the vessel is one of the smaller vessels assigned to buy Alaska salmon.

of 1.5¢ per fish if distance from the fishing ground to the Japanese receiving vessels exceeded 15 miles. Those prices are said to approximate the delivery prices agreed upon between Japanese salmon catcher vessel owners and salmon mothership operators.

Practically all the pinks (the bulk of the purchase) were expected to be packed for export because of greater profits gained by packing, and all the chums were expected to be salted or frozen and sold on the Japanese domestic market.

The four Japanese fishing firms involved in the purchase agreed to pack all pink salmon on purchases only for export to European countries, in order to avoid friction with Unit-

## Japan (Contd.):

ed States packers. It was planned that packing of Alaskan pinks would not begin any earlier than November 1964, so until then the fish were expected to be kept frozen in cold storage. (Nihon Suisan Shimbun, July 20; Suisancho Nippo, July 21 & 22, 1964; Suisan Tsushin, July 22, 1964.)

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#### SALMON PURCHASES FROM ALASKA AS OF AUGUST 7, 1964:

The four Japanese companies engaged in buying Prince William Sound salmon from Alaskan fishermen received deliveries totaling 5,600 tons of salmon as of August 7, 1964. By species, they consisted of 70 percent pink, close to 20 percent chums, and a small quantity of reds. (Suisancho Nippo, August 12, 1964.)

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#### ALASKAN SALMON SALE TO JAPAN COMPLETED:

The sale of Alaska Prince William Sound fresh salmon to the Japanese ended on August 14, 1964. An estimated total of 7,400 tons of fresh salmon was delivered to the refrigerated vessels of the four Japanese fishing firms purchasing the fish. By species, they consisted of close to 80 percent pink, 20 percent chum, and small quantities of red and silver salmon. While deliveries exceeded the 6,000 tons reportedly guaranteed by the Alaskan sellers, the quantity was considerably below the 11,000 tons of vessel-carrying capacity provided by the purchasers.

Of the 8 Japanese vessels that were reported as having withdrawn from Prince William Sound, 4 returned to Gulf of Alaska waters to resume trawl operations, and another trawler and a shrimp mothership resumed operations in the Eastern Bering Sea. (Suisancho Nippo, August 18, 1964.)

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#### SALMON, CRAB, AND BOTTOMFISH MOTHERSHIP FISHERIES IN NORTH PACIFIC FIND POOR FISHING:

The 11 Japanese salmon motherships (accompanied by 369 catcher vessels), operating in the North Pacific Ocean north of 45° N. latitude (Area A), were experiencing unusually poor fishing as of late July 1964. Some

fleets were not expected to fulfill their production targets by the August 10 closing date. As of July 20, the total salmon catch was reported as slightly over 33,000 metric tons, or 74 percent of the mothership fleet target of 44,665 metric tons. By species, that catch consisted of approximately 15,000 tons of chum, 10,000 tons of red, 4,700 tons of silver, 3,000 tons of pink, and 800 tons king salmon.



Fig. 1 - A type of Japanese fishery factoryship (accompanied by trawlers) that operates in the North Pacific and Bering Sea.

The 14 Japanese bottomfish mothership fleets operating in the northern waters (Okhotsk Sea, Bering Sea, and North Pacific Ocean) landed a total of 190,000 metric tons of bottomfish as of July 10. This was an increase of 60,000 metric tons over landings made during the same period in 1963. The production increase is due to the operation of one additional fish meal factoryship this year and to improved organization of fleet operations. There has been a notable catch increase in Alaskan pollock, herring, rockfish, and cod, whereas the high-priced halibut and sablefish landings have fallen below 1963 production. The Japanese Fisheries Agency estimates that the total 1964 mothership-type bottomfish landings will likely come up to 400,000 metric tons, compared with approxi-



Fig. 2 - Repairing crab baskets aboard a Japanese crab mothership.

## Japan (Contd.):

mately 310,000 metric tons landed in 1963.

The 1964 mothership crab operations in the northern waters are reported to be progressing satisfactorily. The two crab motherships operating in the Bristol Bay had packed a total of 150,000 cases of canned crab meat as of July 15, and were expected to attain their production goal of 235,000 cases by the end of September. By fleet, the Tokei Maru (5,835 gross tons) had packed 80,000 cases (production target 120,000 cases), and the Dainichi Maru (5,858 gross tons), 70,000 cases (production target 115,000 cases). The four crab mothership fleets operating off the western coast of Kamchatka Peninsula had packed a total of 197,000 cases as of July 15 or close to 80 percent of their production target of 252,000 cases ( $\frac{1}{2}$ -lb. 48's). Production by fleet is: Yo-ko Maru (9,800 gross tons), 53,000 cases; Kai-vo Maru (5,449 gross tons), 48,000 cases; Hakuyo Maru (6,372 gross tons), 46,000 cases; and Seiyo Maru (6,404 gross tons), 50,000 cases. (Suisan Keizai Shimbun, July 24, 1964.)

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#### SALMON MOTHERSHIP FISHERY FOR 1964 CLOSES WITH CATCHES SLIGHTLY UNDER TARGET:

The 1964 Japanese mothership-type salmon fishery in the North Pacific Ocean north of 45° N. latitude (Area A) came to a close on August 10, 1964, with catches by all fleets falling slightly below assigned targets. The combined fleet catch totaled 44,483 metric tons, 182 tons below the quota of 44,665 metric tons allotted to the mothership salmon fishery. Composition of catch was reported as: 41 percent chum; 30 percent red; 22 percent silver (including a small percentage of king); and 7 percent pink salmon. The 11 Japanese salmon motherships engaged in the fishery were accompanied by 369 catcher vessels. (Shin Suisan Shimbun, August 17, 1964.)

\* \* \* \* \*

#### NORTH PACIFIC MOTHERSHIP SALMON PRICES ADJUSTED:

Negotiations between the Japan National Federation of Salmon Fishermen's Cooperative Associations (NIKKEIREN) and the Northern Water Salmon Mothership Council to establish final salmon delivery prices resulted in a settlement on August 5, 1964. The final 1964 prices represent a straight 7-percent increase over 1963 prices and are for fresh whole salmon delivered by catcher vessels to the motherships.

Following are the final Japanese North Pacific mothership 1964 salmon delivery prices with comparisons:

Species	1964 Prices		1963 Prices	
	Yen/kg.	U.S. Cents/lb.	Yen/kg.	U.S. Cents/lb.
Red	217.2	27.4	203.0	25.6
Chum	117.7	14.9	110.0	13.9
Pink	94.7	11.9	88.5	11.2
Silver	128.4	16.2	120.0	15.2
King	128.4	16.2	120.0	15.2

The newly negotiated price agreement replaces the provisional flat 5-percent increase agreed to on May 15, 1964, by NIKKEIREN and the mothership companies. (Suisan Keizai Shimbun, August 6; Suisan Tsushin, August 6, 1964.)

Editor's note: We have had several inquiries concerning the seemingly high prices for salmon paid to the Japanese fishermen. We have checked our sources carefully and believe the published prices are reliable. Despite the high cost of the raw product to the Japanese packers, we believe they are able to maintain their competitive position on the world canned salmon market for the following reasons:

1. Labor cost: The labor cost is very low. For example, our understanding is that the workers on the Japanese motherships receive an average salary of about \$145 a month. At shore-based plants in Hokkaido, the cannery workers, mostly women, are provided, in addition to room and board, a monthly salary ranging from \$20-30 a month.

2. Meat recovery: Recovery of meat per pound of fish is believed to be higher in Japan than in the United States. For example, meat attached to the head section is recovered manually by the Japanese and canned as "tid-bits."

3. Utilization of byproducts: Japanese packers pack salmon caviar incidentally to their canning operations. The value of this product, which has a special market in Japan, is reported to be substantial. For example, in 1963 processed pink salmon roe (caviar) is said to have sold for \$4.00 a pound on the wholesale market. First grade roe of other species sold for about \$20-25 a pound. The fact that Japan has arranged to obtain salmon roe from United States canneries further attests to the economic value of that product. Another byproduct is salmon carcasses. For example, on the motherships, scraps remaining from the canning operations are processed for later conversion into fertilizer.

4. Other products: Large quantities of pink and chum salmon are salted. The return to the packer on the salted product compares favorably to that for the canned product. Smoked salmon is becoming a popular item in Japan. Smoked red salmon has a ready market in West Germany and the United Kingdom. The return to the producer on this specialty item is reported good.

\* \* \* \* \*

#### EXPERIMENTAL NORTHWEST ATLANTIC TRAWL OPERATIONS:

The Japanese trawler Aoi Maru No. 2 (1,386 gross tons) has been conducting experimental trawl fishing in the northwest Atlantic Ocean off Newfoundland for about one-and-a-half years. She was scheduled to end operations by late July 1964, owing to expiration of her permit. The Japanese firm that owns the trawler does not intend to plan any further operations in the northwest Atlantic until it has evaluated the results of the experimental operations from all angles. Experimental fishing with the Aoi Maru has revealed that the

Japan (Contd.):

trawler is not properly designed and equipped for operation in the northwest Atlantic Ocean, where sea conditions have been found to be far more severe than in the Bering Sea.

Tenyo Maru No. 3 (3,500 gross tons), the second Japanese trawler conducting trial operations in the northwest Atlantic Ocean under a permit which expired in August 1964, was expected to remain longer in the northwest Atlantic trawling grounds if the Government approves the extension of her permit.

The Japanese Fisheries Agency, which had planned to license operation of the Northwest Atlantic trawl fishery this year, is reported to have decided to withhold decision on it until 1965, in view of the inconclusive results so far obtained from the experimental operations. (Suisan Keizai Shimbun, July 15, 1964.)

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#### ATLANTIC BOTTOMFISH RESOURCES TO BE SURVEYED BY JAPANESE FISHERIES AGENCY:

The Japanese Fisheries Agency is developing plans to actively conduct resource investigations in fiscal year 1965 (April, 1965-March 1966), for the Japanese distant-water trawl fishery. Primary objective of the program is to gain a better understanding of the state of resources off the coast of Africa as well as in the northwest Atlantic Ocean, where greater fishing restrictions possibly may be imposed upon trawl operations now being conducted by various countries, including Japan.

Under present plans, the Fisheries Agency hopes to charter one 300-ton trawl vessel for exploratory operations off the African coast and also plans to have a Government fishery investigator board a large fishing company's research vessel to conduct investigations in the northwest Atlantic Ocean. (Shin Suisan Shimbun Sokuho, July 23, 1964.)

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#### JAPANESE TO FISH SWORDFISH IN NORTHWEST ATLANTIC:

Three Japanese fishing vessels were scheduled in July 1964 to the northwest Atlantic fishing grounds on an experimental long-line swordfish operation. This is the first time that the Japanese vessels will be fishing for swordfish off the northwest Atlantic coast. The first vessel, An-ei Maru No. 7 (180 gross tons), departed Kesennuma, Japan, on July 18, and was to be followed by the Ryoun Maru (192

gross tons) and the Tenyo Maru (192 gross tons). The three vessels will operate out of Saint Pierre Island (French), off the coast of Newfoundland, and their catches will be either dressed or filleted, packaged, and frozen aboard the vessels. Products will be exported through the trading firm located at Saint Pierre Island. The three vessels are expected to land a total of 15,000 metric tons of swordfish in one year.



A swordfish being hauled aboard a Japanese catcher boat.

Japanese swordfish exports to the United States have been declining since 1963. Last year, exports dropped to 4,500 tons from 9,000 tons delivered in 1962. The export quota for 1964 is 5,500 short tons, 500 tons less than in 1963. The decline in exports reportedly is due primarily to good swordfish catches being made by United States fishermen along the Atlantic Coast following the change from harpoon fishing to long-line fishing in 1963. But it is also attributed to smaller swordfish landings being made by Japanese fishing vessels. (Nihon Suisan Shimbun, July 15 & 22, 1964.)

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#### EXPORTS OF CANNED SAURY, AUGUST 1963-JUNE 1964 AND ESTIMATES FOR FOLLOWING BUSINESS YEAR:

Japanese canned saury contracted for export during August 1, 1963-June 30, 1964, decreased 5.8 percent or 59,815 cases below the exports for the same period in the previous business year, announced the Japan Canned Saury Packers Association at a meeting held in July 1964.

The Japan Canned Saury Packers Association also adopted a production quota of 1.5 million cases of export canned saury for the 1964 business year (August 1964-July 1965), based

## Japan (Contd.):

Table 1 - Japanese Exports of Canned Saury, August 1963-June 1964 and August 1962-June 1963		
Country or Area of Destination	Aug. 1963-June 1964	Aug. 1962-June 1963
	..... (No. of Cases) .....	
Philippines . . .	416,985	404,518
Burma . . . . .	89,444	100,101
Egypt . . . . .	90,000	148,053
New Guinea . . .	221,665	155,034
Ceylon . . . . .	85,000	119,875
Malaysia . . . . .	19,041	64,410
Other countries .	55,341	45,300
Total . . . . .	977,476	1,037,291

ficer position in foreign countries, \$4,800 to establish a nongovernment fishery representative position at overseas fishing bases, \$31,500 to conduct water pollution control studies, \$20,700 to establish health clinics for distant-water vessel crews, and \$11,250 to improve the wireless telephone system used by Japanese fishing vessels. (Shin Suisan Shimbun Sokuho, July 29; Suisan Keizai Shimbun, July 29, 1964.)

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Table 2 - Estimated Japanese Canned Saury Exports for Business Year, August 1964-July 1965							
Country or Area of Destination	In Tomato Sauce				Natural		Total
	1-Lb. Oval, 48's	8-Oz. Oval, 96's	5-Oz. Tall, 100's	1-Lb. No. 4 <sup>1</sup> / <sub>2</sub>	5-Oz. Tall, 100's	1-Lb. No. 4 <sup>1</sup> / <sub>2</sub>	
	(In 1,000 Cases)						
Philippines. . . . .	170	20	30	30	140	310	700
Burma . . . . .	70	-	-	130	-	-	200
Egypt . . . . .	-	-	-	-	100	50	150
New Guinea . . . . .	60	10	-	-	60	100	230
Ceylon . . . . .	-	-	-	-	60	90	150
Malaysia . . . . .	20	5	5	-	-	-	30
Other countries . . . . .	10	5	5	5	5	10	40
Total . . . . .	330	40	40	165	365	560	1,500
1/Japanese can size.							

1/Japanese can size.

on export estimates for the 1964 business year. (Suisan Tsushin, July 11, 1964.)

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### FISHERIES AGENCY BUDGET FOR FISCAL YEAR 1965:

The Japanese Fisheries Agency is requesting a budget of 26,875 million yen (US\$74.7 million) for fiscal year 1965 (April 1965-March 1966--an increase of about 8,275 million yen (\$22.9 million), or over 44 percent, above the budget of 18,600 million yen (\$51.7 million) allocated in fiscal year 1964.

The 1965 budget submission shows that the Agency is requesting a large increase in appropriations for the coastal fishery improvement program--\$7.3 million compared with \$3.8 million in 1964. A sizable budgetary increase is also being requested for the fish marketing program in order to stabilize fish prices--\$915,000 compared with \$759,000 for the current fiscal year. A sum of \$630,000 has been submitted for biological research related to international fisheries, compared with \$383,000 budgeted in 1964.

For new programs, the Agency is requesting \$51,500 to establish a resident fishery of-

### COMPENSATION LAW FOR LOSS OF FISHING GEAR AND CATCH REVISED:

The Japanese Fisheries Agency disclosed that on April 24, 1964, Article 17 of the "Rules for the Enforcement of Fishing Vessels Compensation Law" was amended to compensate vessel owners for the value of the cargo of fish, fuel, and gear jettisoned to alleviate damage to a vessel when grounded, and to compensate vessel owners for the value of fishing gear actually in use and abandoned when pursued by a foreign patrol vessel. Under this amendment, compensation was to be based on the following formula:

$$\text{Compensation} = \frac{\text{Value of the vessel}}{\text{value of vessel + cargo, etc.}} \times \frac{\text{amount of insurance}}{\text{value of insured cargo, etc.}}$$

However, on June 25, 1964, that formula was deleted from the amendment by Ministerial Order, Ministry of Agriculture and Forestry, and a simple statement was substituted to the effect that compensation will be for the value of the cargo, fuel, and gear jettisoned to alleviate damage to a vessel when grounded and for the value of the gear abandoned which was in operation at the time of pursuit by a foreign patrol vessel. (Fisheries Attache, United States Embassy, Tokyo, July 14, 1964.)

\* \* \* \* \*

Japan (Contd.):

**FISHERIES AGENCY STUDYING MEASURES TO COPE WITH OECD RECOMMENDATIONS:**

The Japanese Fisheries Agency is studying measures to cope with developments likely to affect the Japanese fishing industry because of Japan's entry this year into the Organization for Economic Cooperation and Development (OECD). In view of the OECD fishery recommendations that subsidies and other financial supports to the fishing industries be reduced and progressively abolished, the Agency feels that OECD will, in the future, very likely urge Japan to place a curb on government loans to her fishing industry. (Suisan Keizai Shimbun, August 12, 1964.)

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**EXTENSION OF PRIVATE KELP AGREEMENT WITH JAPAN RECOGNIZED BY SOVIETS:**

Soviet Premier Khrushchev, at a meeting held on July 14, 1964, with Japanese Socialist delegates who were in Moscow to discuss territorial problems with the Russians, is reported to have told the group that the Soviet Union intends to recognize the extension of the present (one year) U.S.S.R.-Japan private kelp agreement over a period of two years. This announcement has been received favorably by the Japanese kelp industry as an act of goodwill by the Soviet Union. (Shin Suisan Shimbun Sokuho, July 16, 1964.)

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**ADDITIONAL FOREIGN CURRENCY SOUGHT FOR SOUTH KOREAN FISHERY IMPORTS:**

The Japan Fishery Products Importers Association, which earlier this year obtained foreign currency allocations of US\$1 million from the Japanese Government to import fishery products from the Republic of South Korea, is seeking an additional \$1 million for additional imports. The Association, which has already purchased \$700,000 worth of cuttlefish and \$300,000 worth of yellowtail from South Korea this year, hopes to import more yellowtail from that country during the fall and winter yellowtail fishing season.

Japanese imports of South Korean fishery products have been increasing yearly. In 1961, imports from that country totaled US\$850,000, in 1962 \$1 million, and in 1963 \$1.3 million. Imports in 1964 are expected to

show a substantial increase over the previous year. (Minato Shimbun, July 25, 1964.)

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**MINISTERIAL CONFERENCE WITH CANADA CONVENED IN TOKYO:**

The Japan-Canada ministerial conference to discuss economic and trade problems of the two countries was to be held in Tokyo, September 4 and 5, 1964. Problems related to the North Pacific Fisheries Convention and Canada's establishment of a 12-mile fishing zone were also to be discussed at that conference. The Japanese were hopeful that the Tokyo meeting would help resolve the problems associated with the North Pacific fisheries treaty arrangements between the United States, Canada, and Japan which were scheduled for further discussion by all three countries at another meeting in Ottawa at a later date. (Suisan Keizai Shimbun, August 5, 1964.)

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**JAPANESE FISHERIES AGENCY AUTHORIZES PURCHASE OF DUTCH WHALING FACTORYSHIP:**

The Japanese Fisheries Agency on August 5, 1964, authorized three Japanese fishing firms to jointly purchase the Netherlands Whaling Company's whale factoryship Willem Barendsz (26,830 gross tons), including that factoryship's 6-percent international whale-catch quota. The purchase of the Dutch whale factoryship will increase Japan's share of the international whale catch quota from 46 percent to 52 percent, or from 3,680 blue-whale units to 4,160 units, based on the 3,000 blue-whale catch limit informally adopted by the 4 whaling nations for the Nineteenth Antarctic Whaling Expedition. The Fisheries Agency also announced that the Japanese Government would recognize the catch quota adopted by the 4 whaling nations for the 1964/65 season. (Minato Shimbun, August 7, 1964.)

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**TRAWLER SOLD TO GREEK FIRM:**

The Japanese trawler Aoi Maru No. 2 (1,150 gross tons), which in late July 1964 concluded 1½ years of exploratory trawling in the Northwest Atlantic, has been sold to a Greek firm. Delivery will be made at Las Palmas, Canary Islands. The Japanese owners of the Aoi Maru No. 2 sold the trawler as a result of finding that the vessel was inadequately equipped and too small for trawl op-



## Japan (Contd.):

erations in the Northwest Atlantic. (Suisan Tsushin, August 6 1964.)

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EXPERIMENTAL SUCTION-PUMP FISHING:

A suction pump has been used to catch fish in Japan, it was reported at a meeting of the Japan Fisheries Academy in Otaru. In the course of a survey of modern fishery methods, a team of the Nihon University's Fishery Department used a pump to land a catch weighing 12.5 kilograms (27.5 pounds) in 15 minutes.

Experiments with the pump were conducted from an 11-ton vessel in waters near Ajishima Island off the Ojika peninsula in May and June 1963. The suction pump was powered by an electric motor connected to a rubber hose, 5 meters (16.4 feet) long, with a trumpet-shaped mouthpiece at one end. Lights installed on the ship and fixed to the mouthpiece attracted fish. The technique had been tried in the Japanese fisheries before but on earlier occasions, the fish were invariably damaged.

Soviet fishing vessels are reported to have successfully employed the suction-pump fishing method in the Caspian Sea. (Australian Fisheries Newsletter, May 1964.)

**Netherlands**WHALING FACTORYSHIP SOLD TO JAPAN:

The Netherlands Whaling Company has announced that it is selling its whaling factoryship Willem Barendsz to Japanese interests under a contract which has a duration of two years. At the end of that period, the vessel will be resold to the Netherlands Whaling Company at a predetermined price, as the Japanese are only interested in the catching rights attached to the factoryship. Those rights will be retained by the Japanese after the vessel is resold to the Netherlands. Before becoming effective, the contract for the sale of the Netherlands factoryship must be approved by the Japanese Government.

The management of the Netherlands Whaling Company has sold 2 of its 10 catcher vessels to Norway. The other 8 vessels will be

sold as scrap. After the Willem Barendsz returns to the Netherlands, the company will try to sell the vessel as a freezer ship or as a tanker.

The Netherlands Whaling Company is disposing of its fleet as a result of disappointing results in the Antarctic in recent years. (United States Consulate, Amsterdam, July 23, 1964.)

**New Caledonia**JAPANESE FISHING FIRM WITHDRAWS FROM TUNA BASE AT NOUMEA:

The large Japanese fishing company engaged in tuna fishing operations at Noumea, New Caledonia (French possession), has withdrawn. The firm is seeking the Fisheries Agency's permission to retain the 7,500-ton tuna quota allotted to the Noumea base.

The firm sent a representative to the Caribbean Sea islands to investigate the possibilities of establishing a tuna base in that area to facilitate tuna exports to the United States, Canada, and Cuba. (Suisancho Nippo, July 27, 1964.)

**New Zealand**SOUTH COAST BLUEFIN TUNA EXPLORATIONS:

Bluefin tuna in New Zealand southern waters appear to be present in commercial quantities from mid-January to April. The statement was made by New Zealand's Marine Department following a three-week exploratory cruise off the Fiordland coast by the Department's chartered fishing vessel Olwyn.

Conclusions reached as a result of the explorations were: (1) tuna are found in temperatures as low as 12° C. (53.6° F.) and feed in depths as shallow as five fathoms; (2) tuna appear to be attracted by white lures in preference to other colors; (3) a trolling line of 60 feet appears to be most successful, providing a rubber spring is inserted to take the pull of the strike; and (4) vessels could fish for tuna in the calm of the sounds, providing the weather is suitable for rounding Puysegur Point at the southwest tip of New Zealand's South Island.

## New Zealand (Contd.):

The objective of Olwyn's cruise was primarily to assess the potential of southern bluefin tuna and to study their distribution in relation to hydrological conditions in the area. The vessel was equipped with a live-bait tank and gear for pole fishing, and was also rigged to troll 8 lines.

Surface temperatures in Foveaux Strait were all below average but 3 tuna strikes were made just before the vessel rounded Puysegur Point. She then sailed to Dusky Sound and ran into a confused northerly sea and swell. Surface temperatures averaged 54.5° F, and the sea was a murky bottle green color. Under those conditions, 600 pounds of southern bluefin tuna were caught between Dusky and Nancy Sounds in 12 hours' trolling time.

Schools of tuna were sighted at the entrance to Charles and Bligh Sounds. At least 8 strikes were made in that area. The thermocline was at 120 feet and tuna were caught in depths ranging from 5 to 70 fathoms.

It was conceded by the Marine Department that considerable research will be needed before the commercial possibilities of that fishery can be assessed. The New Zealand Marine Department plans to be working on this project in the next year or so. (Commercial Fishing, a New Zealand fishery periodical, May 1964.)

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TREND TO SMALL STERN TRAWLERS:

This year one New Zealand firm built two 70-foot stern trawlers. They were built by an Auckland shipyard.

Each stern trawler cost about NZ\$35,000 (US\$97,000) and carries a crew of three, including the skipper. A total of three small stern trawlers has been built.

Apart from normal trawling, one fishing firm plans to experiment with shrimp, tuna, and line fishing. Another firm is also reported to be looking for another two similar stern trawlers. It hopes to buy them overseas.

Both new trawlers for the one firm are identical and can store up to 40 metric tons of fish as compared with the 20 to 25 tons

carried by ordinary small trawlers. (Commercial Fishing, New Zealand, May 1964.)



## Norway

EXPORTS OF CANNED FISH,  
JANUARY 1-MAY 25, 1964:

Norway's total exports of canned fish during January 1-May 25, 1964, were down 5.1 percent from those in the same period of 1963. Shipments of canned small sild dropped 21.4 percent and those of kippered herring were down 10.6 percent. But shipments of canned brisling increased 15.6 percent from the same period a year earlier and there were some increases in the exports of several other canned fish products.

Norwegian Exports of Canned Fish		
Product	1/Jan. 1-May 23 1964	Jan. 1-May 25 1963
	..... (Metric Tons) .....	
Brisling . . . . .	2,209	1,911
Small sild . . . . .	4,503	5,728
Kippered herring . . .	1,187	1,328
Soft herring roe . . .	805	349
Sild delicatessen . . .	183	167
Shellfish . . . . .	680	607
Other fishery products .	1,173	1,232
Total . . . . .	10,740	11,322
1/ Preliminary.		

The packing of sild sardines started in early May and by June 13, 1964, a total of 83,860 standard cases of small sild had been packed, compared with 89,952 standard cases in the comparable period of 1963.

The pack of brisling from the start of the season in late May to June 13, 1964, amounted to 121,114 standard cases, compared with 56,289 standard cases in the same period of 1963.

Mackerel landings for canning purposes totaled 92 tons as of June 6, 1964, compared with 188 tons in the corresponding period of 1963. (Norwegian Cannery Export Journal, July 1964.)

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CANNED FISH EXPORTS,  
JANUARY-MARCH 1964:

Smoked small sild sardines in oil was Norway's most important canned fish export in January-March 1964, accounting for 36.7

## Norway (Contd.):

percent of the quantity and 30.7 percent of the value of total shipments during the period.

Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-March 1964

Product	January-March 1964		
	Quantity	Value	
	Metric Tons	N. Kroner	US\$
		1,000	1,000
Smoked brisling in oil . . .	1,327	8,934	1,248
Smoked brisling in tomato . .	162	912	127
Smoked small sild in oil . . .	2,259	9,841	1,374
Smoked small sild in tomato .	374	1,342	187
Unsmoked small sild in oil . .	172	568	79
Small sild, unclassified . . .	97	364	51
Kipperd herring (Kippers) . .	754	3,380	472
Mackerel . . . . .	159	765	107
Roe unclassified . . . . .	163	626	87
Soft herring roe . . . . .	134	679	95
Fish balls . . . . .	118	305	43
Other canned fish . . . . .	21	160	22
Shellfish . . . . .	411	4,151	580
Total . . . . .	6,151	32,027	4,472

Table 2 - Norwegian Exports of Canned Fishery Products/ by Country of Destination, January-March 1964

Country of Destination	January-March 1964		
	Quantity	Value	
	Metric Tons	N. Kroner	US\$
		1,000	1,000
Finland . . . . .	54	292	41
Sweden . . . . .	85	414	58
Belgium-Luxembourg . . . . .	157	754	105
Ireland . . . . .	49	207	29
France . . . . .	67	265	37
Netherlands . . . . .	46	157	22
United Kingdom . . . . .	1,202	5,823	813
West Germany . . . . .	181	710	99
Czechoslovakia . . . . .	97	313	44
Japan . . . . .	3	12	2
South Africa Republic . . . . .	466	1,853	259
Iraq . . . . .	40	150	21
Canada . . . . .	149	899	125
United States . . . . .	2,544	13,856	1,935
Australia . . . . .	460	1,845	258
New Zealand . . . . .	107	465	65
Other countries . . . . .	234	884	123
Total <sup>2/</sup> . . . . .	5,941	28,899	4,036

1/Does not include exports of canned shellfish.

2/Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Notes: (1) Norwegian kroner 7.16 equal US\$1.

(2) See Commercial Fisheries Review, June 1964 p. 53.

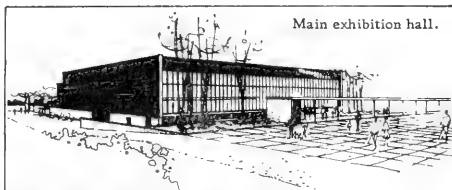
The United States was the leading buyer of Norwegian canned fish during January-March 1964, taking 42.8 percent of total shipments (excluding shellfish), followed by the United Kingdom with 20.2 percent, the South Africa Republic with 7.8 percent, and Australia with 7.7 percent. (Norwegian Cannery Export Journal, July 1964.)

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## INTERNATIONAL FISHERIES FAIR AT TRONDHEIM:

Manufacturers of all types of machinery, equipment, and instruments for the fishing industry and related fields are invited to exhibit at the Second Official Norwegian Fisheries Fair which will be held at the exhibition hall in Trondheim, Norway, August 19-29, 1965.

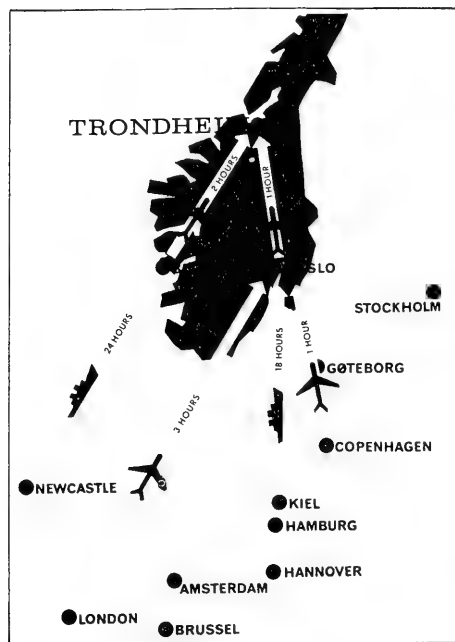
The list of items to be displayed includes: (1) fishing craft and engines; (2) accessories such as anchors, chains, lanterns, tackle, galley equipment, fittings, searchlights, and lifesaving equipment; (3) navigational equipment such as radio, radar, asdic, and other instruments; (4) fishing gear such as seines, lines, nets, floats, trawls, hunting weapons; and impregnating materials; (5) fishermen's clothing and provisions; (6) fish processing machinery and refrigerating equipment; (7) manufactures (food and other); (8) transport appliances, containers, and store equipment; (9) angling equipment; (10) services provided by lifeboat associations, insurance companies, banks, publishers, etc.



The Norwegian Ministry of Fisheries is sponsoring the Fair in order to improve the position of the Norwegian fishing industry by bringing to its attention the most efficient machinery, instruments, and auxiliary equipment available today.

The Fair offers United States manufacturers a unique opportunity to display and sell United States products to a large industry which must keep up with technological development in order to survive. For example, the Norwegian fishing in-

## Norway (Contd.):



## Peru

## EXPORTS OF PRINCIPAL MARINE PRODUCTS, JANUARY-MARCH 1963-64:

Item	1/Jan.-Mar. 1964			Jan.-Mar. 1963		
	Quantity	Value2/		Quantity	Value2/	
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal . .	335,098	947.1	35,313	326,393	861.9	32,136
Fish oil . . .	31,879	96.4	3,594	56,887	88.9	3,315
Fish (frozen, canned, etc.)	5,759	49.6	1,849	7,318	48.9	1,823

1/Preliminary.

2/F.o.b. values converted at rate of 26.82 soles equal US\$1.00.

Source: United States Embassy, Lima, July 9, 1964.



## Portugal

## REFRIGERATION EQUIPMENT TO MODERNIZE FISHING INDUSTRY SUPPLIED BY BRITISH:

In July 1964, a British firm announced a contract with the Fundo de Renovacao e de Apetrechamento da Industria de Pesca, Lisbon, to supply a considerable amount of refrigeration equipment for the fishing vessels and shore installations required in connection with the Portuguese Government's fisheries development plans. Under the agreement, the British firm expects to supply equipment with a value in excess of £800,000 (US\$2,240,000).

The first order under the agreement covers freezing and cold-storage equipment for the five new stern trawlers being built at Portuguese shipyards in Viana do Castelo and Figueira da Foz. Each vessel will have a freezing capacity of over 28 tons of whole fish a day in 8 plate freezers and a storage capacity for about 500 metric tons of frozen fish at -25° C. (-13° F.). The installed power of the refrigerating machinery will be 28.5 B.h.p. and it will operate on the pump circulation of Refrigerant 12 through the freezers, with brine-cooled pipe grids in the refrigerated holds.



## South Africa Republic

## PILCHARD-MAASBANKER FISHERY:

April 1964: The shoal fish catch off the Cape west coast of the South Africa Republic in April 1964 was 21,775 short tons pilchards, 7,954 tons maasbanker, 13,989 tons mackerel, and 3,636 tons anchovy for a total of 47,354 tons. That compares with 67,941 tons pilchards, 3,676 tons maasbanker, and 401 tons mackerel landed in April 1963.

The April 1964 catch yielded 10,527 short tons of fish meal, 576,890 imperial gallons of fish body oil, 421,656 pounds of canned pilchards, 1,198,424 pounds of canned maas-

dustry has recently shown considerable interest in pumps for handling fish in nets or for unloading fish from vessels.

The trade exhibit will cover an effective floor area of about 32,000 square feet indoors and 21,000 square feet outdoors. Rental charges will be US\$1.95 per square foot indoors with a minimum charge of \$210 indoors and \$1.11 per square foot outdoors with a minimum charge of \$119. The deadline for space applications is December 1, 1964. Applications should be addressed to Norges Varemesse, P.O. Box 130, Skoyen, Oslo 2, Norway. (Cable Address: Vare-messen.)

Arrangements for electricity, plumbing, and telephones should be made directly with the management. Electric current is 220 volts, 50 cycles. Insurance may be obtained locally. Samples and exhibits may be imported duty-free provided they are exported within eight months after their importation. Ample storage space is available. There will be restaurant facilities and parking space for visitors at the Fair.

The first official Norwegian Fisheries Fair was held in Bergen, Norway, in 1960. However, it was not open to foreign participation. (United States Embassy, Oslo, July 26, 1964.)



## South Africa Republic (Contd.):

banker, and 4,668,672 pounds of canned mackerel.

The Cape west coast shoal fish catch for the first four months of the 1964 season was 189,561 tons pilchards, 17,397 tons maasbanker, 41,733 tons mackerel, and 3,636 tons anchovy. The total catch was 252,327 tons. In the same period of 1963, the total catch was 260,546 tons, made up of 238,239 tons pilchards, 7,673 tons maasbanker, and 14,634 tons mackerel.

At Walvis Bay in South-West Africa, the pilchard catch amounted to 203,013 tons during January-April 1964. (The South African Shipping News and Fishing Industry Review, June 1964.)

\*\*\*\*\*

**March 1964:** The shoal fish catch off the Cape west coast of the South Africa Republic in March 1964 was 56,850 short tons pilchards, 6 tons maasbanker, and 17,751 tons mackerel for a total of 74,607 tons. That compares with 54,901 tons pilchards, 3,724 tons maasbanker, and 9,940 tons mackerel landed in March 1963.

The March 1964 catch yielded 17,082 short tons of fish meal, 886,350 imperial gallons of fish body oil, 141,768 pounds of canned pilchards, and 4,772,224 pounds of canned mackerel.

The Cape west coast shoal fish catch for the first three months of the 1964 season was 168,060 tons pilchards, 9,443 tons maasbanker, and 27,744 tons mackerel. The total catch was 205,247 tons. In the same period of 1963, the total catch was 188,538 tons, made up of 170,298 tons pilchards, 3,997 tons maasbanker, and 14,233 tons mackerel.

At Walvis Bay in South-West Africa, the pilchard catch amounted to 99,835 tons during January-March 1964. (The South African Shipping News and Fishing Industry Review, May 1964.)

\*\*\*\*\*

**EXPORTS OF FISHERY PRODUCTS, 1963:**

In 1963, fish meal was South Africa's most important fishery export item (from the standpoint of total value), followed by frozen spiny lobster tails, and canned pilchards. The United

Kingdom was the leading market for South African fish meal, while the United States was

South Africa Republic Exports of Fishery Products, 1963			
Commodity and Destination	Value <sup>2/</sup>		
	Quantity 1,000 Pounds	Rand 1,000	US\$ 1,000
<b>Fresh and Frozen:</b>			
<b>Spiny lobster tails:</b>			
United States . . . . .	11,978.2	8,098.5	11,281.2
France . . . . .	214.6	133.2	185.5
Other countries . . . . .	146.2	98.1	136.7
<b>Total . . . . .</b>	<b>12,339.0</b>	<b>8,329.8</b>	<b>11,603.4</b>
<b>Other fresh and frozen fishery products:</b>			
Australia . . . . .	8,025.6	1,068.4	1,488.3
Rhodesia and Nyasaland . . . . .	5,496.2	604.8	842.5
United Kingdom . . . . .	3,777.0	464.2	646.6
Italy . . . . .	4,970.5	337.7	470.4
United States . . . . .	1,882.1	190.2	265.0
France . . . . .	963.4	198.3	276.2
Mozambique . . . . .	1,514.8	109.6	152.7
Other countries . . . . .	3,734.9	420.9	586.3
<b>Total . . . . .</b>	<b>30,364.5</b>	<b>3,394.1</b>	<b>4,728.0</b>
<b>Preserved (Mostly Canned):</b>			
<b>Spiny lobster tails:</b>			
United States . . . . .	291.2	218.2	304.0
France . . . . .	139.6	89.7	125.0
West Germany . . . . .	117.1	86.8	120.9
Belgium . . . . .	62.0	48.4	67.4
Other countries . . . . .	35.8	28.3	39.4
<b>Total . . . . .</b>	<b>645.7</b>	<b>471.4</b>	<b>656.7</b>
<b>Pilchards:</b>			
United Kingdom . . . . .	4,345.0	1,120.1	1,560.3
United States . . . . .	4,827.3	732.2	1,019.9
Other countries . . . . .	39,253.5	3,465.4	4,827.3
<b>Total . . . . .</b>	<b>51,345.5</b>	<b>5,317.7</b>	<b>7,407.5</b>
<b>Other preserved fishery products:</b>			
United Kingdom . . . . .	14,867.3	1,579.2	2,199.8
United States . . . . .	7,694.3	671.1	934.9
Other countries . . . . .	22,081.3	2,252.5	3,137.7
<b>Total . . . . .</b>	<b>44,642.9</b>	<b>4,502.8</b>	<b>6,272.4</b>
<b>Dried, Salted, and Cured:</b>			
Australia . . . . .	5,522.1	805.2	1,121.6
Other countries . . . . .	4,109.8	327.3	455.9
<b>Total . . . . .</b>	<b>9,631.9</b>	<b>1,132.5</b>	<b>1,577.5</b>
<b>Industrial Products:</b>			
<b>Fish meal and solubles:</b>			
United Kingdom . . . . .	184,388.8	5,808.2	8,090.8
East Germany . . . . .	64,853.4	2,042.3	2,844.9
West Germany . . . . .	42,148.8	1,310.2	1,825.1
Japan . . . . .	44,406.2	1,538.1	2,142.6
United States . . . . .	24,400.9	708.7	987.2
Israel . . . . .	24,135.6	724.6	1,009.4
Netherlands . . . . .	23,403.6	717.9	1,000.0
Australia . . . . .	11,377.0	350.0	487.6
Other countries . . . . .	52,610.2	1,888.7	2,631.0
<b>Total . . . . .</b>	<b>471,724.5</b>	<b>15,088.7</b>	<b>21,018.6</b>
<b>Fish-body oil:</b>			
United Kingdom . . . . .	68,088.3	2,595.9	3,616.1
Other countries . . . . .	1,989.6	105.1	146.4
<b>Total . . . . .</b>	<b>70,077.9</b>	<b>2,701.0</b>	<b>3,762.5</b>
<b>Fish-liver oil:</b>			
Canada . . . . .	379.4	24.4	34.0
United States . . . . .	3,211.5	3,12.8	17.8
Other countries . . . . .	26.3	2.4	3.3
<b>Total . . . . .</b>	<b>617.2</b>	<b>39.6</b>	<b>55.1</b>

(Continued on next page.)

## South Africa Republic (Contd.):

Commodity and Destination	Quantity		Value <sup>2/</sup>	
	1,000 Pounds	Rand 1,000	US\$ 1,000	
Whale and seal oil:				
United Kingdom . . . . .	10,400.1	791.2	1,102.2	
West Germany . . . . .	6,663.2	506.1	705.0	
United States . . . . .	1,925.1	156.1	217.4	
Netherlands . . . . .	1,476.2	60.3	84.0	
Other countries . . . . .	210.8	36.1	50.3	
Total . . . . .	20,675.4	1,549.8	2,158.9	

1/Includes South-West Africa.

2/F.o.b. value.

3/Includes exports to the United States of 2,100 pounds of concentrated fish-liver oil valued at Rand 2,070 (US\$2,884).

Note: US\$1.393 equals South African Rand 1.00.

the main buyer of South African lobster tails. (United States Consulate, Cape Town, July 28, 1964.)



## Spain

FISHERY TRENDS AT VIGO,  
APRIL-JUNE 1964:

**Landings and Prices:** Fishery landings at the port of Vigo, Spain, in April-June 1964 totaled 18,755 metric tons valued at 213.8 million pesetas (US\$3.6), an increase of 19.7 percent in quantity but a decrease of 6.9 percent in value from the first quarter 1964 landings. Compared with April-June 1963, landings this quarter dropped 26.5 percent in quantity and 32.2 percent in value.

The lower value of the second quarter 1964 landings was due to the light demand by fish canneries as they were reluctant to buy raw materials because of the large carryover of canned fish still on hand from the previous season. Normally, the April-June period is the beginning of accelerated cannery production but because of the ample canned fish stocks on hand the canneries were not disposed to produce at the usual normal rate.

Landings of frozen fish at Vigo (part of which is imported fish) totaled 2,738 tons in the second quarter of 1964, all of it landed during May as compared with landings of 3,686 tons in the first quarter of the year. The quantity of frozen fish landed in April-June 1964 is not included in the quarterly landings of fresh fish.



Fig. 1 - Port of Vigo, Spain. Wooden hull trawlers outfitted for tuna fishing.

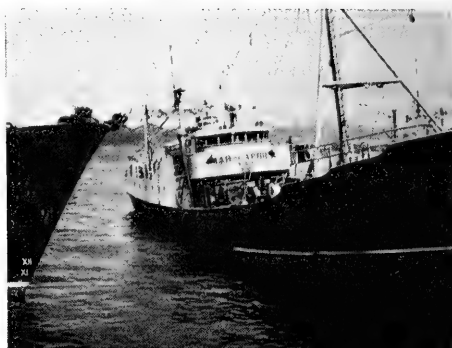


Fig. 2 - Cod fishing vessels docked at Vigo. They fish for cod in the North Atlantic.

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, April-June 1964 with Comparisons

Species	1964						1963		
	April-June			January-March			April-June		
	Quantity	Average Price		Quantity	Average Price		Quantity	Average Price	
	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.
Octopus . . . .	3,495	5.03	3.8	906	7.09	5.4	6,903	5.14	3.9
Horse mackerel	3,431	2.58	2.0	1,934	4.69	3.5	3,473	3.46	2.6
Small hake . .	2,694	29.93	22.6	4,503	26.47	20.0	3,599	26.74	20.2
Cuttlefish . . .	1,013	7.51	5.7	484	6.99	5.3	1,630	8.92	6.7
Sardines . . .	585	5.86	4.4	-	-	-	1,191	8.16	6.2

## Spain (Contd.):

Table 2 - Distribution of the Fishery Landings at Vigo, April-June 1964 with Comparisons

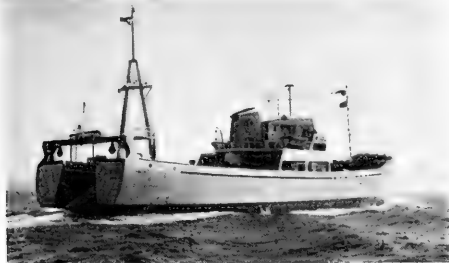
Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, Drying Fish Meal, etc.) and Local Consumption
	..... (Metric Tons) .....		
2nd Quarter 1964	11,013	1,545	6,197
1st Quarter 1964	11,139	890	3,643
2nd Quarter 1963	10,083	5,214	10,232

**Canned Fish Industry:** The canned fish industry was practically inactive during April-June 1964 as far as production was concerned—only 1,545 tons of fish was packed as against 5,214 tons in the same period a year earlier.



Fig. 2 - Unloading semiprocessed or green salted cod at Vigo.

At the beginning of the second quarter in 1964 there was a substantial recovery in the quantity of exports of canned fish and the domestic market was also somewhat more active. The upturn was shortlived and fish can-

Fig. 4 - Spanish fishing stern trawler Villalba, owned and operated by a Vigo fishery firm.

ners were again reporting low sales at the end of June. In some cases, the movement in sales was brought about by lower prices quoted by canners who wanted to dispose of their excessive stocks to finance production from the new tuna and sardine season. In the case of the domestic market, summer always brings about a higher consumption of canned goods. The economic situation, however, was not favorable and the canned fish industry as a group was trying to obtain official assistance in this crisis.

A group of leading Vigo fish canners was establishing a new factory in Ensenada, Mexico, in association with Mexican interests, for canning Pacific sardines. The production from the Ensenada plant will be sold in the Mexican market, but there are plans for exports to the United States later. (United States Consulate, Vigo, July 17, 1964.)

Note: See Commercial Fisheries Review, August 1964 p. 85.



## Surinam

JAPANESE SHRIMP FISHING OPERATIONS:

The Japanese fishing firm (engaged in a joint enterprise) in Surinam, which was scheduled to ship frozen shrimp to Japan this past July, was established in Paramaribo a little over two years ago. The local United States-owned shrimp processing firm in Surinam (also located in Paramaribo) has been freezing and processing the Japanese shrimp catches and has been acting as their export agents. Except for the one shipment to Japan in July 1964 and another scheduled for September, shrimp caught by the Japanese vessels have been exported exclusively to the United States.

Prior to 1962, the Japanese firm operated 3 fishing vessels off the northern coast of South America (from Georgetown, British Guiana, to the mouth of the Amazon River). Those vessels carried small freezing units and were accompanied by a mothership to which catches could be transferred. Subsequently the mothership sank in the waters of that area.

During the past two years the Japanese fleet has expanded to 10 vessels to equal the size of the United States fleet presently operating out of Paramaribo. The catches of the Japanese trawlers account for about 50 percent of the United States shrimp processing firm's total exports. The 7 vessels purchased by the Japanese firm in the course of the past two years are of United States manufacture. Three are steel-hull trawlers purchased from a Texas shipyard and 4 are wooden-hull trawlers from a Florida shipyard. The present 10 Japanese vessels have 220 hp., and use the same type gear as used on vessels operated by the United States firm in Surinam. The Japanese trawlers have 3 drive winches, 150 fathoms of 7/16-inch steel cable, tickler chain, and are double-rigged. The United States trawlers generally use a flat net whereas the Japanese vessels prefer the balloon net. A few of the Japanese vessels have begun to copy the jib net such as is used by shrimp vessels operating out of Texas. A smaller mesh net of 1-3/4 inches (stretched) is used by the Japanese whereas the United States vessels use a net of 2-1/4 inches (stretched).

Until recently the crews of the Japanese trawlers in Surinam consisted solely of Japanese nationals. Reportedly, the Surinam Government has been exerting pressure to have the

## Surinam (Contd.):

Japanese company conform with a local law requiring 75 percent of the employees of a locally-established company be Surinamers. One source in the local fishing industry there estimated that about an equal number of Surinamers and Japanese are now being employed. Some 35 Japanese nationals are affiliated with the company locally, including the manager, fleet manager, one office employee, and a mechanic. The Japanese personnel of the company were said to be paid from the Tokyo headquarters of the parent company, and receive about 35 to 40 Surinam guilders (about US\$19 to \$21) a month with the balance of their salaries delivered to their families in Japan. Surinamers employed on all trawlers are paid according to the catch, ranging from 25 to 75 guilders (about \$13 to \$40) per metric ton of shrimp caught. Japanese seamen have one-year contracts with the company and the contracts are renewable.

It was reported that all Japanese fishermen receive training in Japan prior to their assignment in Surinam. They are said to be highly adaptable and imitate successfully the methods used by American fishermen, and are also described as being collectivistic and scientific. Each Japanese vessel is assigned a certain area to fish each day and can only move to another area when advised to do so by the manager. The fishing grounds are carefully studied and information pertinent to shrimping in those waters is recorded at the company's local office. This past summer, a fishery technician from Japan went to Surinam as an adviser on how to improve the shrimp catches.

The local manager of the Japanese firm anticipated the purchase of 5 more trawlers in the United States during this year (1964). This will raise the total Japanese fleet operating out of Paramaribo to 15 vessels. It was also reported that the Japanese Government has approved the purchase of as many as 10 more trawlers in the United States. Ultimately, a fleet of 25 vessels is envisaged by the company.

The United States-owned local shrimp freezing, processing, and exporting enterprise was established in 1956. The company enjoys an exclusive license and franchise for the right to catch, handle, purchase, receive, process, freeze and warehouse, sell, and otherwise deal in shrimp for sale and consumption for export only. During the eight years of its existence, operations have expanded rapidly with 1963 exports totaling 1,318,600 pounds of frozen shrimp. Until early 1962 the plant was processing exclusively (or almost exclusively) the catches of United States flag vessels. (United States Consulate, Paramaribo, July 21, 1964.)

Note: Values converted at rate of 1.886 guilders equal US\$1.



## U.S.S.R.

### NEW DEEP-WATER TRAWLING GEAR DEVELOPED:

Soviet gear experts are reported to have developed an improved type of bottom trawl gear that can withstand water pressure at great depths. The improved gear has reinforced floats; heavier (220-265 pounds) rope-length adjusting boards; and longer ropes of smaller diameter but with sufficient strength to withstand the pressure of net hauling by winches. The Soviets plan to use the deep-water gear soon for trawling at depths of up to 1,300 meters (4,264 feet) in the Barents Sea and the North Atlantic Ocean. In the Bering Sea and Okhotsk Sea, they hope to achieve

a substantial increase in landings by using the new gear.

A Soviet RT-type trawler operated by the Soviet Northern Fisheries Administration has found halibut concentrations in the Barents Sea at depths of 850-1,100 meters (2,788-3,608 feet), according to a Japanese press summary of a Soviet news report, dated July 16, 1964. About 20 Soviet trawlers which were led to that area are reported to be making good catches. (Suisancho Nippo, July 29, 1964.)



## United Kingdom

### DANGER TO FISHERIES FROM OIL EXPLORATIONS IN NORTH SEA DISCUSSED:

The explorations for petroleum and natural gas in the North Sea were discussed by the British Minister of Power at a meeting at Lowestoft in late June 1964. The Minister said, "I must be frank with you and say that this search cannot be conducted without some interference with fishing, but I ask you not to be unduly anxious about what is going to happen. In the first place, the Convention on the Continental Shelf, which came into force earlier this month, requires the Government to ensure that the exploration of the British sector and its exploitation does not result in any unjustifiable interference with navigation, fishing, and conservation of the sea. This requirement will be incorporated in the licenses which my Department will issue and the licensees will have to observe."

The Minister said that the charges used by the ships engaged in the exploration would be exploded within a few feet of the surface thus minimizing danger to bottomfish. He added that the exploring oil companies would maintain close contact with British fishery officials.

The Minister stated that no charges in excess of 50 pounds would be exploded within 1 nautical mile of any vessel, and no charge at all within half a mile. (Fishing News, July 3, 1964.)

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### MARINE OIL IMPORTS, 1962-1963:

Net imports of marine oil by the United Kingdom in calendar year 1963 consisted of 117,400 long tons of fish and fish-liver oils, 60,400 long tons of whale oil, and (for statistical purposes) an additional 5,500 tons of whale oil from British Antarctic whaling op-



## United Kingdom (Contd.):

erations--grand total of 183,300 tons. That was 4 percent below the net marine oil imports in 1962 which totaled 191,100 tons and consisted of 106,500 tons of fish and fish-liver oils, 57,000 tons of whale oil, and an additional 27,600 tons of whale oil from British Antarctic whaling operations.

British Utilization of Refined Oils and Fats in Margarine and Compound Cooking Fat Manufacture, 1962-1963				
Item	Margarine		Compound Cooking Fat	
	1963	1962	1963	1962
	..... (1,000 Long Tons) .....			
<b>Marine Oils:</b>				
Whale oil . . . . .	29.5	45.3	17.3	24.9
Fish oil . . . . .	76.7	58.1	40.2	31.1
Total marine oil	106.2	103.4	57.5	56.0
Total utilization of vegetable, animal, and marine oils and fats . . . . .	277.3	270.2	153.4	142.5

The United Kingdom withdrew from Antarctic whaling at the end of the 1962/63 season and sold her remaining whaling fleet to Japan.

The British margarine industry is an important consumer of marine oils. In 1963, there was considerable substitution of fish oils for whale oil in the production of British margarine and compound cooking fat; total utilization of marine oils by that industry in 1963 showed a small increase over the previous year. (United States Embassy, London, April 13, 1964.)

\* \* \* \* \*

### NEW FREEZER-TRAWLER SAILS ON MAIDEN VOYAGE:

The new stern-trawler Ross Valiant successfully completed trials in July 1964 and joined the Grimsby fishing fleet of one of Britain's largest integrated fishing companies. The Ross Valiant carries 10 plate freezers with a combined daily freezing capacity of 35 tons. The vessel will be able to store 400 tons of frozen fish at -20° F.



Fig. 1 - Ross Valiant off Grimsby about to start her maiden voyage to Newfoundland fishing grounds.

The company operating the Ross Valiant plans to add nine more freezer-trawlers to its fishing fleet and has already launched the Cape Kennedy, a sistership to the Ross Valiant. The Cape Kennedy is expected to enter service early in 1965. The company plans to market the frozen fish from its new freezer-

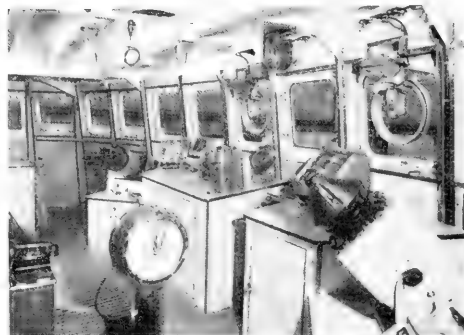


Fig. 2 - The bridge of the Ross Valiant. Shows echo-sounding equipment in the center and transitorized radar equipment to the left.

trawlers under a fixed-price contract arrangement in order to eliminate seasonal fluctuations and stabilize prices. The demand in Britain for fish frozen at sea has increased rapidly the past year.

Note: See Commercial Fisheries Review, April 1964 p. 76.




### Yugoslavia

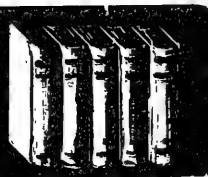
#### TUNA MARKET TO BE SURVEYED BY JAPANESE:

The Japan Export Trade Promotion Organization (JETRO), a Japanese government agency, was reported to be planning on conducting a tuna market survey in Yugoslavia. That country annually imports large quantities of frozen tuna to supplement domestic supply. In 1963, Yugoslavia's frozen tuna imports reportedly totaled 10,070 metric tons, of which 8,077 tons came from Japan, 794 tons from Italy, 448 tons from Israel, 460 tons from Turkey, and 291 tons from the United States. Yugoslavia, therefore, has become a very important tuna market for Japan, constituting the third largest buyer of Japanese tuna, next to the United States and Italy. (Suisan Keizai Shimbun, July 22, 1964.)





# FEDERAL ACTIONS



## Department of Commerce

### AREA REDEVELOPMENT ADMINISTRATION

#### INDUSTRIAL LOAN TO TUNA FIRM IN PUERTO RICO:

Approval of a \$654,576 industrial loan to help Peter Pan Caribe, Inc., establish a tuna-processing, canning, and distribution facility in Ponce, Puerto Rico, was announced August 17, 1964, by the Area Redevelopment Administration (ARA) of the U.S. Department of Commerce. The ARA loan will run for 16 years at an annual interest rate of 4 percent.

The project will help create 250 direct new jobs in the hard-hit Ponce area which has an unemployment rate of 14.4 percent, almost triple the United States national jobless average.

The total cost of the project will be \$1,007,042. In addition to ARA's investment, a private bank will make a loan of \$201,410; the Municipality of Ponce will provide \$100,704; and the company will put up \$50,352. Funds will be used to improve leased land, construct a building, and to buy machinery and equipment.

\* \* \* \* \*

#### INDUSTRIAL LOAN TO HELP ESTABLISH NEW FISH MEAL AND OIL PLANT IN WISCONSIN:

Approval of a \$130,000 industrial loan to help Peninsula Processing Company, Inc., establish a plant to process trash fish into meal, solubles, and oil, was announced August 19, 1964, by the Area Redevelopment Administration (ARA) of the U.S. Department of Commerce. The project is expected to create 86 direct and related new jobs in the Sturgeon Bay, Wis., area. It will also give Sturgeon Bay fishermen a market for the previously unwanted trash fish which had increased to the point of interfering with fishing operations

for commercial species. The high protein and vitamin content of Lake Michigan trash fish will make it possible to process them into marketable poultry feed supplements.

The total project cost will be \$200,000. In addition to the ARA loan that will run for 15 years at 4 percent annual interest, a savings and loan association will invest \$40,000, a local county industrial development corporation will invest \$20,000, and the applicant will put up \$10,000 as equity.

\* \* \* \* \*

#### TECHNICAL ASSISTANCE PROJECT TO STUDY PROPOSED DEEP-WATER PORT FACILITY AT ROCKLAND HARBOR, MAINE:

Approval of a \$45,000 technical assistance project to determine the technical and economic feasibility of constructing a marine pier and terminal at Rockland, Maine, was announced August 20, 1964, by the Area Redevelopment Administration (ARA) of the U.S. Department of Commerce. The project will provide a detailed appraisal of the feasibility of the proposed deep-water port facility at Rockland Harbor, Knox County, Maine.

Earlier studies have indicated an overall feasibility. If the detailed examination shows the project worthwhile, ARA will consider an application for substantial improvement of the harbor facilities which would accommodate existing industries and pave the way for further expansion in the area. The economy of Rockland and its surrounding area has been geared historically to reliance on Rockland Harbor and related industries.

Local government leaders and spokesmen of fishing and business interests in Rockland attest that the harbor improvement is imperative to the needs of the community's future.

\* \* \* \* \*

## CLAM RESEARCH PROJECT IN MARYLAND TO BE CONTINUED:

Approval of a technical assistance project to continue clam research under a two-year contract extension with the Natural Resources Institute, University of Maryland, was announced August 14, 1964, by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce.

Research under the original one-year contract concentrated on basic ways to improve clam-processing techniques and the development of new methods to extend storage life through freezing and other procedures. Work will continue in that field and new emphasis will be placed on the development of quality products and new uses for clams, particularly the popular "ready-to-serve" type of product.

The Maryland seafood industry in Calvert, Dorchester, and Somerset Counties will benefit primarily by application of research results on the spot at existing clam-processing plants. Study results, however, will be applicable to the clam industry in many other areas of the United States.

The State of Maryland has already developed new clam-producing beds and a more efficient dredging process which is expected to expand clam production. A favorable outcome to the clam research project could substantially increase the market for clams and lead to the creation of new jobs and considerable added income for the industry and the area.

The total cost of the 2-year project will be about \$220,000. ARA technical assistance funds will provide about \$64,000. The remainder will come from various state and private sources including the University of Maryland and the clam industry.



## Federal Trade Commission

### RESTRAINT OF TRADE BY CRAB FISHERMEN'S ORGANIZATION IN WASHINGTON STATE BARRED:

An order (Docket No. 7859) announced August 7, 1964, by the Federal Trade Commission (FTC) requires a crab fishermen's association, in Westport, Wash., and its members, to discontinue their coercive restraints in, and their attempt to monopolize, the crab industry.

The association was organized in 1958 under the Fishermen's Collective Marketing Act. During the preceding 3-year period the price of crabs at the dock in Washington was about 8 cents a pound, although it had been as high as 20 cents

in the past. Subsequent to its organization, the association fixed the price through marketing orders and had raised it to 16 cents by 1959. That year its members caught 74 percent of the crabs landed in the entire State of Washington, and apparently almost 100 percent of the catch in Grays Harbor, the most important of the State's 4 major crab port areas. Also in 1959 the association acquired a cannery. In 1960 that cannery accounted for some 45 percent of the total volume handled by the 7 processors located in the Grays Harbor district.

"Processing nearly 20 percent of the total volume of crabs landed in Washington, it is now the second largest processor in the State," the Commission noted. "The business of the other processors has declined accordingly. For example, the total volume of two of the largest of those processors fell from more than 3 million pounds each in 1958 to less than 1 million in 1961, and a large part of the crabs they processed in 1961 was bought not in Washington, but in Alaska. Several of the smaller Washington processors have gone out of business entirely, complaining that they can't pay the prices demanded by the association fishermen and stay in business." The Commission further found that respondents attempted to monopolize the market and that the newly acquired processing plant played a significant role in the attempt. "Further, when the processors yielded and resumed buying from the association fishermen, they were in fact subsidizing their own competitor. As previously noted, the association fishermen financed the purchase and operation of their own cannery company by stock subscriptions of \$1,000 each, payment for the stock to be made by turning over to the cannery, out of each sale of their crab catch, 1¢ for each pound sold, whether the sale was to the association cannery itself or to a third-party processor. (This 1¢ per pound figures to some 6-1/4 percent of the member's gross sales when the crabs are selling at 16¢.) The net effect of this arrangement, therefore, is that every time an independent Washington processor buys \$1 worth of fresh crabs from a member of the association, 6-1/4¢ of the dollar he pays goes directly into the coffers of the association cannery, a competitor of his.

"Even assuming this to be fair competition ordinarily, it certainly becomes unfair when coupled, as here, with a substantial degree of monopoly power over the supply of the source product. Here, these respondents, using first their unlawfully acquired control of the crab fishing fleet, and then a combination of that power with their control of a substantial share of the processed product, leveraged the price of fresh crabs up from 14¢ (at the time the cannery was acquired) to 16¢ a pound. Having thus acquired an additional 2¢ in profits, the association fishermen then applied half of that gain—1¢—to the financing and strengthening of their own cannery. Hence, the cannery itself was financed not out of the lawful profits of the association fishermen, but out of funds extracted from the pockets of the independent processors by the use of coercively acquired monopoly power. . . .

The Commission held that there is "no necessity for divestiture of respondents' processing plant. While divestiture would be an appropriate remedy if there was no other effective means of dissipating the effects of their attempted monopolization, . . . such is not the case here. The monopolization attempt found here was accomplished by coercion and could only continue, we believe, by continued coercion. Deprived of that unlawful weapon, respondents will be restrained by competition from other crab fishermen, including the processors themselves. This, we think, will strike an even balance of power between the two segments of the industry, and protect the public interest in the survival and prosperity of both."

The FTC's order halting the coercive activities of the crab fishermen's association covers all aquatic products, not merely Dungeness crabs, and has no geographical limitation.



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### NEW FOOD ADDITIVE REGULATION CONCERNING PACKAGING MATERIALS FOR FOODS PRESERVED BY IRRADIATION:

A regulation listing packaging materials which may be used, under prescribed conditions, in radiation preservation of prepackaged foods was issued by the Commissioner of Food and Drugs, effective August 14, 1964, as an amendment to food additive regulations (Title 21, Code of Federal Regulations, Part 121).

The new regulation as it appeared in the Federal Register, August 14, 1964, follows:

### Title 21—FOOD AND DRUGS

#### Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

##### SUBCHAPTER B—FOOD AND FOOD PRODUCTS PART 121—FOOD ADDITIVES

#### Subpart F—Food Additives Resulting From Contact With Containers or Equipment and Food Additives Otherwise Affecting Food

##### PACKAGING MATERIALS FOR USE IN RADIATION PRESERVATION OF PREPACKAGED FOODS

The Commissioner of Food and Drugs, having evaluated the data submitted in a petition (FAF 1297) filed by the U.S. Atomic Energy Commission, Washington, D.C. 20545, and other relevant material, has concluded that the food additive regulations should be amended to provide for the use of packaging materials that may be safely subjected to irradiation incidental to the radiation preservation of prepackaged foods. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. 348(c)(1)), and under the authority delegated to the Commissioner by the Secretary of Health, Education, and Welfare (21 CFR 2.90; 29 FR. 471), the food additive regulations are amended by adding to Subpart F the following new section:

§ 121.2543 Packaging materials for use in radiation preservation of prepackaged foods.

The packaging materials identified in this section may be safely subjected to irradiation incidental to the radiation preservation of prepackaged foods, subject to the provisions of this section.

(a) The radiation preservation of the food itself shall comply with regulations in Subpart G of this Part 121.

(b) The following packaging materials may be subjected to a dose of irradiation,

not to exceed 1 megarad, incidental to the use of gamma radiation in the radiation preservation of prepackaged foods:

(1) Nitrocellulose-coated cellophane complying with § 121.2507.

(2) Glassine paper complying with § 121.2526.

(3) Wax-coated paperboard complying with § 121.2528.

(4) Polypropylene film prepared from polypropylene basic polymer complying with § 121.2501. The finished film may contain adjuvant substances used in compliance with §§ 121.2001 and 121.2511.

(5) Ethylene-alkene-1 copolymer film complying with § 121.2508.

(6) Polyethylene film complying with § 121.2510.

(7) Polystyrene film prepared from styrene basic polymer. The finished film may contain adjuvant substances used in compliance with §§ 121.2001 and 121.2511.

(8) Rubber hydrochloride film prepared from rubber hydrochloride basic polymer having a chlorine content of 30-32 weight percent and having a maximum extractable fraction of 2 weight percent when extracted with *n*-hexane at reflux temperature for 2 hours. The finished film may contain adjuvant substances used in compliance with §§ 121.2001 and 121.2511.

(9) Vinylidene chloride-vinyl chloride copolymer film prepared from vinylidene chloride-vinyl chloride basic copolymers containing not less than 70 weight percent of vinylidene chloride and having a viscosity of 0.50-1.50 centipoises as determined by ASTM method D 729-57. The finished film may contain adjuvant substances used in compliance with §§ 121.2001 and 121.2511.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the FEDERAL REGISTER file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show where-in the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing. A hearing will be granted if the objections are supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

**Effective date.** This order shall be effective on the date of its publication in the FEDERAL REGISTER.

(Sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. 348(c)(1))

Dated: August 10, 1964.

Geo. P. LARRICK,  
Commissioner of Food and Drugs.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### BUREAU OF COMMERCIAL FISHERIES

#### REGULATIONS FOR USE OF FISHERY RESOURCE DISASTER FUNDS ANNOUNCED:

Regulations to cover the use of resource disaster funds under a section of the Commercial Fisheries Research and Development Act of 1964 were announced on August 27, 1964, by the U.S. Department of the Interior. Secretary of the Interior Stewart L. Udall said action now is being taken to assist the Great Lakes fishing industry recover from economic losses suffered in 1963. Fishermen, processors, and distributors of smoked chubs in the Great Lakes area are in serious difficulty as the result of a loss of market following an outbreak of botulism.

Funds are available under the Act during the 1965 fiscal year, which began July 1, 1964, to provide payments to the industry to help offset losses caused by removal of the chubs from normal channels of trade. The fish, now in storage, will be used for reduction into fish meal or will be destroyed.

Interior's Bureau of Commercial Fisheries will administer the payments after approved application on the following basis: No. 1 chubs, 21 cents per pound; No. 2 chubs, 7 cents per pound. An additional payment of 5 cents per pound may be made if processing costs totaling at least 5 cents have been incurred.

The Bureau said removal of the chubs from usual trade channels will open up markets for the depressed Great Lakes fishing industry and allow resumption of fishing operations which have been at a virtual standstill since last fall.

The regulations, published in the Federal Register, apply to Section 4 (b) of the Act. Regulations applying to other sections of the Act will be announced later.

Section 4 (b) authorizes the allocation of \$400,000 annually for two years and \$650,000 for each of the following three years to states where there is a commercial fishery failure due to a resource disaster arising from natural or undetermined causes.

The regulations as they appeared in the August 27, 1964, Federal Register follow:

## Title 50—WILDLIFE AND FISHERIES

### Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

#### SUBCHAPTER F—AID TO FISHERIES

#### PART 253—COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT

On Pages 9454 through 9456 of the FEDERAL REGISTER of July 10, 1964, there was published a notice and text of a proposed new Part 253 of Title 50, Code of Federal Regulations. Authority to issue such regulations has been vested in the Secretary of the Interior by section 8 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309).

The purpose of the new part is to establish procedures to be used by the Secretary in providing financial assistance to State Agencies for research and development of the commercial fisheries resources of the Nation and, in cooperation with State Agencies, directly to the commercial fisheries in cases where the Secretary has determined that there is a commercial fishery failure due to a resource disaster arising from natural or undetermined causes.

The notice further provided for submission to the Director, Bureau of Commercial Fisheries, of written comments, suggestions or objections concerning the proposed regulations, within 30 days of publication in the FEDERAL REGISTER, except that comments with respect to § 253.4 Use of Resource Disaster Funds, had to be submitted within 10 days.

Comments have been received and evaluated for § 253.4. Minor changes for clarification purposes have been made.

Since early adoption of the proposed new § 253.4. Use of Resource Disaster Funds, is in the public interest in order to help relieve an emergency due to a commercial fishery failure in the Great Lakes area, this amendment is adopted as set forth below.

#### § 253.4 Use of resource disaster funds.

(a) *Determination.* The Secretary shall cause to be published in the FEDERAL REGISTER a notice of finding that a commercial fishery failure due to a resource disaster arising from natural or undetermined causes exists at the time such a finding is made. After such publication, resource disaster funds may be used for the following purposes with the cooperation of the respective State Agencies:

(1) Payments causing the removal from the usual markets of stocks of fish or shellfish of the species listed in the said finding which are preventing normal trade operations. No payments will be made under this paragraph unless the Secretary deems such action necessary to aid in restoring normal trade operations; the person receiving such payment, if not the primary producer, provides evidence that he has reimbursed the primary producer, or such other person from whom the raw fish was purchased; the person receiving such payments has furnished the Secretary with such information regarding purchases, costs, sales, etc., as the Secretary may require; and satisfactory evidence of re-

removal of the products from channels of distribution, including storage, shall be provided to the Secretary. No payments may be made for any product which was removed from storage or other channels of distribution prior to the approval of this Act.

(2) Payments to primary producers of the species of fish listed in the said finding to assist them in obtaining gear or equipment necessary to operate in the same or a different fishery than that affected by the said resource disaster. No payments will be made under this paragraph unless the Secretary deems such action necessary to aid in restoring primary producers adversely affected by the said commercial fishery failure to a condition where they can operate profitably; the person receiving such payments furnishes the Secretary with such information regarding catches, sales and costs as the Secretary may require; and the person receiving such payments agrees to operate the gear purchased with the assistance of such payment in a manner satisfactory to the Secretary.

(3) Short-term loans for operating expenses of primary producers. When

loans are made under this paragraph, the interest rate shall be 3 percent and repayment will be required only from net profits of the fishing operation, which net profit shall be reduced by such reasonable amount as determined by the Secretary for the salary of the fisherman. No such loans will be made unless the Secretary deems such action necessary to aid in restoring primary producers adversely affected by the said commercial fishery failure to a condition that will permit them to resume operations; the funds are not otherwise available on reasonable terms; and the past earning and credit record of the applicant is such that it provides reasonable assurance of repayment.

(4) Payments to State Agencies for projects directly related to the restoration of the fishery affected by the said resource disaster or to prevent a similar failure of the fishery in the future. Such preliminary project proposals and their processing will be subject to all regulations relating thereto in this Part, except that these projects will be given preference over other proposed projects with reference to the use of funds ob-

tained under subsection 4(b) of the Act, and Federal funds may be used for 100 percent of the cost of the project if all of the funds are obtained from appropriations authorized under subsection 4(b) of the Act.

(b) *Non-determination.* At any time when there is no finding of a commercial fishery failure as described in subsection (a) of this section, the Secretary may, if he deems such action to be in furtherance of the purposes of the Act, approve preliminary project proposals for funding under subsection 4(b) of the Act from funds carried over from previous fiscal years; provided however, that no preliminary project proposal from any State will be funded under this subsection until that State has had all of its available apportioned funds, if any, obtained from appropriations authorized under subsection 4(a) of the Act, obligated.

This amendment shall become effective on the date of publication in the FEDERAL REGISTER.

JOHN W. KELLEY,  
Acting Secretary of the Interior.

Note: See Commercial Fisheries Review, this issue p. 25; September 1964 p. 100.



## Small Business Administration

### LOANS TO NEW ENGLAND COMMERCIAL FISHERIES FIRMS IN JULY 1964:

Approval of 3 commercial fisheries loans in July 1964 was announced August 3, 1964, by the Boston Regional Office of the Small Business Administration (SBA), a \$3,000 direct commercial fishing loan to run 6 years at 4 percent annual interest was made by SBA to Carl Sherman Purington of Addison, Maine. The loan funds were used to liquidate a 90-day note on Purington's vessel.

The Brown Fish Meal Company of Eastport, Maine, received a \$7,500 direct loan from SBA. The firm will use the funds for debt retirement and as working capital. The loan was for 6 years at 4 percent annual interest. Both loans were made in depressed areas and were thus eligible for the low 4 percent interest rate.

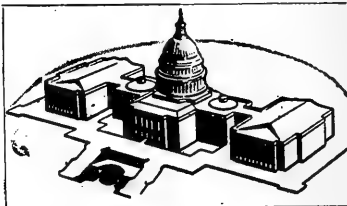
Seafair Inc., Phippsburg, Maine, received a \$15,000 direct loan from SBA for 6 years at 5½ percent annual interest. The loan helps provide building, equipment, and working capital for the firm which is operating a clam-cleansing plant.



## Eighty-Eighth Congress

### (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ALASKAN FUR SEALS:** On September 1, 1964, Senator Bartlett spoke in the Senate on Alaskan fur seals and inserted in that day's *Congressional Record* (p. 20564) an article from the August 27, 1964, issue of the "New York Times" on the sealskin harvest in the Pribilof Islands.

**ALASKA OMNIBUS ACT AMENDMENT:** H. Rept. 1710, Amending the Alaska Omnibus Act (August 6, 1964, report from the Committee of conference, House of Representatives, 88th Congress, 2nd Session), 6 pp., printed. The Committee recommended that the Senate

recede from its disagreement to the amendment of the House to S. 2881, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes; also that the Act be cited as the "1964 amendments to the Alaska Omnibus Act." Total amount authorized to be appropriated is not to exceed \$55,650,000. Contains the amendments and statement of the managers on the part of the House.

Senator Gruening of Alaska spoke in the Senate on September 3, 1964, inserting in the Congressional Record (p. 20834), the message of the Governor of Alaska to the special legislative session called on August 31 in Alaska. Governor Egan outlined the steps necessary to implement the Federal assistance program.

**ANADROMOUS FISH CONSERVATION:** On August 12, 1964, the House Committee on Merchant Marine and Fisheries reported (H. Rept. 1768), with amendment, H. R. 2392, a bill to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states.

H. Rept. 1768, Authorizing the Secretary of the Interior to Initiate a Program for the Conservation, Development, and Enhancement of the Nation's Anadromous Fish (August 12, 1964, report from the Committee on Merchant Marine and Fisheries, House of Representative, 88th Congress, 2nd Session), 15 pp., printed. The Committee favorably reported (with amendments) and recommended passage of H. R. 2392. Contains the purpose, need, background, and section-by-section analysis of the legislation, and departmental reports.

On September 1, 1964, House suspended the rules and passed, amended, H. R. 2392. As passed by the House, the bill authorizes the Secretary of the Interior to cooperate with the states in a program on behalf of anadromous fish. Up to \$25 million could be appropriated from Federal funds for 50-percent cost-sharing in the program. Not more than 20 percent of the total could be spent in any one state. Involved are such species of fish as salmon, steelhead, shad, and striped bass.

**CHEMICAL PESTICIDES COORDINATION:** On September 1, 1964, the House suspended the rules and passed, amended, H. R. 4487, to amend the act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides. Passed by a record vote of 236 yeas to 110 nays. As passed by the House, H. R. 4487 authorizes the Secretary of the Interior (Fish and Wildlife Service) to study the effects of pesticides on fish and wildlife and then transmit the information to the Secretary of Agriculture. Information on how injury to fish and wildlife can be prevented or minimized would then be printed on the labels of pesticide containers. Section 2 of the bill would raise the ceiling on pesticide research by the Service to \$3.2 million for current (1965) fiscal year and \$5 million annually thereafter. The ceiling under existing law is \$2,565,000.

Objection was raised to the consideration of S. 1251, to amend the act of August 1, 1958, as amended, to increase the authorization for pesticide research by the Secretary of the Interior. The Senate thus must consider the House bill. Senate bill authorizes the same amounts for research as the House bill, but eliminates the section on labeling.

On September 3, 1964, the Senate passed H. R. 4487, after adopting an amendment to substitute for its text the language of S. 1251, companion bill, as it passed the Senate on June 22, 1964.

**CONTINENTAL SHELF LANDS:** H. R. 11961 (Aspinall), was introduced in the House July 21, 1964, at the request of the Department of Defense, to permit the Department of Defense and the Department of the Interior to furnish notice to Congress relating to the restriction of outer continental shelf lands for defense purposes; referred to the Committee on Interior and Insular Affairs.

**FOOD-FOR-PEACE, AND FISH:** Extension of P. L. 480, 83rd Congress (Hearing before the Committee on Agriculture and Forestry, United States Senate, 88th Congress, 2nd Session), 110 pp., printed. Contains hearing held August 12, 1964, on S. 1498, S. 2687, and S. 2925 to extend the Agriculture Trade Development and Assistance Act of 1954 (P. L. 480, 83rd Congress) and for other purposes. Contains statements from Senators, Federal officials, and representatives of associations.

On August 12, 1964, the Senate agreed to the amendment offered by Senator McGovern to H. R. 11380, a bill to amend further the Foreign Assistance Act of 1961, as amended, which authorizes the appropriation of \$50 million under the authority of the foreign aid bill now before the Senate for the purchase of domestically-produced beef, poultry, other meats and meat products, dairy products, rice, and other high-protein foods which are in adequate supply in the United States for donation to school lunch and similar programs in foreign countries which are eligible for assistance under the bill. Senator McGovern stated that other high-protein foods would include fish and fish products. Senator Bartlett also submitted an amendment to implement the provision of P. L. 480 which added fish to the food-for-peace program, but he later withdrew the amendment after it was considered and discussed.

On September 2, 1964, the House adopted by a voice vote H. Res. 865, the rule providing for the consideration of 2 hours of debate on H. R. 12298, to extend the Agriculture Trade Development and Assistance Act of 1954 (P. L. 480-83rd Congress). The House concluded all debate and commenced reading the bill for amendment but did not conclude consideration of the bill.

On September 3, 1964, by a record vote of 349 yeas to 6 nays the House passed H. R. 12298. The passage was subsequently vacated and S. 2687, a similar bill, was passed in lieu after being amended to contain the House-passed language. A substitute amendment that provided new text for section 1 of the bill was adopted that eliminated an amendment tentatively adopted earlier regarding congressional supervision and appropriations for the making of grants on loans of foreign currencies. The House insisted on its amendment to S. 2687, requested a conference with the Senate, and appointed conferees.

On September 10, 1964, the Senate disagreed to House amendments to S. 2687, to extend for 2 years the Agriculture Trade Development and Assistance Act of 1954, agreed to conference and appointed conferees.

**HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS FOR 1964:** (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), Part 1, 1,074 pp., Part 2, 1,018 pp., printed. Contains hearings held on H. R.

10809, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1965, and for other purposes. Includes statements and budget summaries from the agencies covered, as well as statements from outside witnesses. Included are funds under the Food and Drug Administration for botulism research, under the Public Health Service for water pollution control, shellfish sanitation, shellfish certification. Testimony was presented on the Public Health Service's two new laboratories for shellfish sanitation measures—one in Alabama to service the southern states and one in Rhode Island to serve the northeast. Also, on dams and oysters, and the depuration process for certain mollusks.

Bill reported in Senate August 17, 1964, by the Committee on Appropriations (S. Rept. 1460). Passed Senate, amended, August 19, 1964. Senate asked for a conference August 19, 1964, and House agreed to conference Sept. 1, 1964.

S. Rept. 1460, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriations Bill, 1965 (Aug. 17, 1964, report from the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), 82 pp., printed. The Committee on Appropriations recommended passage, with amendments of, H. R. 10809, appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies for the fiscal year ending June 30, 1965, and for other purposes. Committee recommendations are presented and explained. Contains budget estimates for each agency. Under Department of Health, Education, and Welfare appropriations are funds for water supply and water pollution control; shellfish sanitation, shellfish certification; special investigation of water pollution in the lower Mississippi where large fish kills have occurred. Under Food and Drug Administration funds are included for botulism research.

A Senate-House conference committee on September 2, 1964, ordered a favorable report (H. Rept. 1880) on H. R. 10809. Conferees granted \$35,009,000 for Water Supply and Pollution Control. The amount agreed upon includes \$500,000 for a special investigation of water pollution in the lower Mississippi. No funds are included for the forward staffing of regional water pollution control laboratories, as proposed by the Senate.

H. Rept. 1880, Departments of Labor, and Health, and Welfare, and Related Agencies Appropriations Bill, 1965 (Sept. 2, 1964, report from the Committee on Conference, House of Representatives, 88th Congress, 2nd Session), 10 pp., printed. The Committee on Conference disagreed to Senate amendments on H. R. 10809, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1965, and for other purposes. The Committee appropriated \$35,009,000 for Water Supply and Water Pollution Control instead of \$34,239,000 as proposed by the House and \$35,354,000 as proposed by the Senate. The amount agreed upon includes \$500,000 for special investigation of water pollution in the lower Mississippi where large fish kills have occurred. No funds are included for the forward staffing of regional water pollution control laboratories as proposed by the Senate. Contains the recommendations of the Committee of Conference, and a statement of the managers on the part of the House.

**PACIFIC ISLANDS TRUST TERRITORY DEVELOPMENTS:** On August 12, 1964, the House concurred in the Senate amendments to H. R. 3198, to promote the economic and social development of the Trust Territory of the Pacific Islands, and cleared the bill for the President. As amended by the Senate, the act provides that the Trust Territory would retain its current status as a "foreign area" for the purposes of the Tariff Act. On August 22, 1964, the President signed H. R. 3198 (P. L. 88-487).

**PUBLIC WORKS APPROPRIATIONS, 1965:** (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), Part 1, 1,248 pp.; Part 2, 1,166 pp.; printed. Contains hearings held on H. R. 11579, making appropriations for civil functions to allow for continuing progress in the nation's water resources development and for a limited number of new starts on surveys and planning and construction projects, for fiscal year ending June 30, 1965, and for other purposes. Functions are administered by the Department of the Army, certain agencies of the Department of the Interior, the Atomic Energy Commission, the Tennessee Valley Authority, and certain study commissions. Includes statements and budgets from the agencies concerned. Funds for Fish and Wildlife Coordination Act studies by the U.S. Fish and Wildlife Service are included.

H. R. 11579 reported by Committee on Appropriations June 17, 1964 (H. Rept. 1479). Passed by House June 16, 1964. Reported in Senate August 5, 1964, by Committee on Appropriations (S. Rept. 1326). Passed by Senate, amended, August 7, 1964. Senate asked for a conference same day; House agreed to conference August 12, 1964. Conference report filed August 13, 1964 (H. Rept. 1794). House and Senate agreed to conference August 14, 1964.

H. Rept. 1794, Public Works Appropriation Bill, 1965 (Aug. 13, 1964, report from the Committee of Conference, House of Representatives, 88th Congress, 2nd Session), 44 pp., printed. Committee of Conference disagreed to Senate amendments to H. R. 11579, making appropriations for certain civil functions administered by the Department of Defense, the Panama Canal, certain agencies of the Department of the Interior, the Atomic Energy Commission, the St. Lawrence Seaway Development Corporation, the Tennessee Valley Authority, and the Delaware River Basin Commission for the fiscal year ending June 30, 1965, and for other purposes. The Committee appropriated \$210,000 for Fish and Wildlife Coordination Act studies by the Fish and Wildlife Service which is the same amount as the approved budget estimate for fiscal year 1965. Includes budget summaries from agencies covered, and appropriations recommended by House Committee of Conference.

**STATE DEPARTMENT APPROPRIATIONS, FY 1965:** Departments of State, Justice, and Commerce, The Judiciary and related Agencies Appropriations, 1965 (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), Part 1, 987 pp.; Part 2, 911 pp.; printed. Contains hearings held April 14-July 8, 1964, on H. R. 11134, making appropriations for the Departments of State, Justice, and Commerce, The Judiciary, and related Agencies for the fiscal year ending June 30, 1965. Contains testimony and statements from various Federal officials and Senators. Included in State Department appropriations are funds for the International Fisheries Commissions.



S. Rept. 1380, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations Bill, 1965 (Aug. 12, 1964, report from the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), to accompany H. R. 11134, 29 pp., printed. The Committee recommended passage (with amendments) of H. R. 11134, appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for fiscal year ending June 30, 1965, and for other purposes. Committee recommendations are presented and explained. Contains a general statement, budget estimates for each agency, and major provisions of the bill. Included under Department of State are funds for International Fisheries Commission. The Senate Committee recommended \$2.1 million for this item--\$100,000 over the House allowance, but \$39,000 under the budget estimate.

H. Rept. 1817, Departments of State, Justice, and Related Agencies Appropriations Bill, 1965 (Aug. 15, 1964, report from the Committee of Conference, House of Representatives, 88th Congress, 2nd Session), 7 pp., printed. The Committee of Conference disagreed to Senate amendments to H. R. 11134, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary and related agencies for the fiscal year ending June 30, 1965, and for other purposes. Contains the recommendations of the Committee of Conference and a statement of the managers on the part of the House. Under the Department of State, the Committee recommended for International Fisheries Commission \$2,025,000 instead of \$2.0 million as proposed by the House and \$2.1 million as proposed by the Senate.

On August 17, 1964, the House and Senate adopted the conference report (H. Rept. 1817) on H. R. 11134, making appropriations for the Department of State for FY 1965, clearing the legislation for the President. Included in the compromise bill is \$2,025,000 for International Fisheries Commissions, an increase of \$25,000 over the House-passed bill, but \$75,000 less than the amount recommended by the Senate. The 1965 appropriation is \$25,000 more than the amount appropriated for FY 1964, but \$114,000 less than the amount requested in the Department's FY 1965 budget estimate.

**VESSEL CONSTRUCTION SUBSIDY AMENDMENTS:** On August 18, 1964, the Senate agreed to House Amendments to S. 1006, for the correction of inequities in the construction of fishing vessels and cleared the bill for the President. On August 30, 1964, the President signed S. 1006 (P.L. 88-498).

**VESSELS OF THE UNITED STATES, 1964:** H. Doc 274, Merchant Vessels of the United States, 1964 (including Yachts), 1,272 pp., printed. House of Representatives, 88th Congress, 2nd Session, 1964. Lists every American merchant vessel (including fishing vessels and yacht which had an uncancelled document on January 1, 1964. Also specifies official number, signal letters, name, rig, tonnage, home port, and place and date of construction of every such vessel. Annual publication of Bureau of Customs, Treasury Department, to comply with act of Congress. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402, at \$7.25 a copy.)

**WATER POLLUTION:** On September 10, 1964, Senator Morse spoke in the Senate and inserted in that day's Congressional Record (pp. 21305-21306) an article from the September issue of American Forest en-

titled "Pollution: Everybody's Fight." The article gives particular attention to the discharge into rivers and streams of industrial waste and sewage from numerous towns, cities, and industries. Also to the problem that salmon and steelhead runs in Oregon cannot be maintained if water quality is not improved. There is concern for 70 million chinook salmon planted in the Willamette during the spring of 1964 by that State's Fish Commission and the U.S. Fish and Wildlife Service. Congressman Green inserted the same article in the Apendix of the same Congressional Record (pp. A4667-A4669).

**WATER POLLUTION CONTROL ADMINISTRATION:** Water Pollution Control and Abatement (Part 1A & 1B--National Survey)--(Hearings before a Subcommittee of the Committee on Government Operations, 88th Congress, 1st Session), Part 1A, 940 pp.; Part 1B, 972 pp., printed. Contains hearings held May 21-24, 27-29; June 3-6, 10-14, 18, 20, & 25, 1963. The Committee held hearings on Nation's problems of water pollution and what should be done to control and abate them. Contains statements given by Congressmen, Senators, various Federal and state officials, conservation groups, industry representatives, and others.

On September 2, 1964, the House Committee on Public Works met in executive session on S. 649, and related bills, regarding water pollution. No final action was taken and the Committee continued in executive session on September 3, 1964.

On September 3, 1964, the House Committee on Public Works ordered favorably reported to the House S. 649, and related bills regarding water pollution, to amend the Federal Water Pollution Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate, or navigable waters, and for other purposes. On September 4, 1964, the House Committee on Public Works reported to the House S. 649.

**WATER RESOURCES COUNCIL:** On August 21, 1964, Congressman Donohue under an extension of remarks in that day's Congressional Record (pp. A4505-A4506) urged that appropriate steps be taken to bring before the House for passage before the Congress ends S. 1111, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a Water Resources Council and river basin commission, and providing financial assistance to the states in order to increase state participation in such planning.

On September 2, 1964, the House Committee on Interior and Insular Affairs reported, amended, S. 1111 (H. Rept. 1877). Referred to the House Committee of the Whole House on the State of the Union.

**WHALE CONSERVATION:** On September 8, 1964, Senator Bartlett of Alaska spoke in the Senate on the depletion of the whale population, and inserted in that day's Congressional Record (pp. 21033-21034) an article from the August 1964 issue of the Seattle "Fishermen's News" concerning Japan's obligations under the International Whaling Convention.



# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE  
OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHING-  
TON, D. C. 20402. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOL-  
LOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISH-  
ERY PRODUCTS AND BYPRODUCTS.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED  
DISTRIBUTION).

Number	Title
CFS-3478	Michigan Landings, January 1964, 2 pp.
CFS-3484	New Jersey Landings, 1963 Annual Sum- mary, 10 pp.
CFS-3490	New York Landings, 1963 Annual Summary, 12 pp.
CFS-3509	Massachusetts Landings (By Gear and Sub- area), 1963 Annual Summary, 14 pp.
CFS-3523	Frozen Fishery Products, May 1964, 6 pp.
CFS-3534	Louisiana Landings, April 1964, 3 pp.
CFS-3538	Maine Landings, April 1964, 4 pp.
CFS-3539	Texas Landings, September 1963, 3 pp.
CFS-3541	Texas Landings, October 1963, 3 pp.
CFS-3542	Maryland Landings, 1963 Annual Summary, 11 pp.
CFS-3543	New Jersey Landings, May 1964, 3 pp.
CFS-3544	Ohio Landings, March 1964, 2 pp.
CFS-3545	Wisconsin Landings, April 1964, 2 pp.
CFS-3546	Michigan Landings, April 1964, 3 pp.
CFS-3547	Ohio Landings, April 1964, 3 pp.
CFS-3548	Texas Landings, November 1963, 2 pp.
CFS-3549	Texas Landings, December 1963, 2 pp.
CFS-3550	Rhode Island Landings, February 1964, 3 pp.
CFS-3554	Louisiana Landings, May 1964, 3 pp.
CFS-3556	Maryland Landings, April 1964, 4 pp.
CFS-3558	Maryland Landings, May 1964, 4 pp.
CFS-3560	North Carolina Landings, June 1964, 4 pp.
CFS-3561	Wisconsin Landings, May 1964, 2 pp.
CFS-3562	Maine Landings, May 1964, 4 pp.

### Wholesale Dealers in Fishery Products, 1963 (Revised):

- SL- 4 - Rhode Island, 2 pp.  
SL- 6 - New York Coastal Area, 11 pp.  
SL- 7 - New Jersey, 4 pp.  
SL- 8 - Pennsylvania (Coastal Area), 3 pp.  
SL-13 - North Carolina, 6 pp.  
SL-17 - Alabama (Coastal Area), 3 pp.  
SL-18 - Mississippi (Coastal Area), 3 pp.  
SL-19 - Louisiana (Coastal Area), 7 pp.

- SL-20 - Texas (Coastal Area), 7 pp.  
SL-22 - Oregon, 3 pp.  
SL-23 - Washington, 6 pp.  
SL-33 - North Dakota, 1 p.  
SL-46 - Texas (Mississippi River and Tributaries), 2 pp.

Sep. No. 709 - A Progress Report on the Development  
of International Food Standards.

FL-555 - The Lake Trout (*Salvelinus namaycush*), by  
Paul H. Eschmeyer, 8 pp., illus., February 1964.  
Discusses the lake trout's physical characteristics,  
geographic distribution, reproduction, young of the  
species, age and growth, food, movement, artificial  
propagation, and fisheries. Also discusses the dep-  
redations of the sea lamprey on lake trout in the  
Great Lakes.

FL-561 - List of Fish and Wildlife Service Papers on  
Physical and Chemical Oceanography, 1940-1962, by  
Lola T. Dees, 15 pp., March 1964.

FL-566 - Bacterial Kidney Disease of Salmonid Fishes,  
by Ken Wolf, 4 pp., revised March 1964.

FL-570 - Basic List of Publications in English on Fish  
Diseases and Parasites, by S. F. Snieszko, Glenn L.  
Hoffman, and Ken Wolf, 4 pp., June 1964.

SSR-Fish, No. 459 - The Fishery for Scup with Special  
Reference to Fluctuations in Yield and Their Causes,  
by William C. Neville and Gerald B. Talbot, 65 pp.,  
illus., revised 1964.

SSR-Fish, No. 477 - North Pacific Oceanography, Feb-  
ruary-April 1962, by Felix Favorite and others, 69  
pp., illus., February 1964.

SSR-Fish, No. 482 - Fish Population Studies, Lewis and  
Clark Lake, Missouri, 1956-1962, by Charles H.  
Walburg, 27 pp., June 1964.

Report of the Bureau of Commercial Fisheries for the  
Year 1962, 101 pp., illus., printed, 1964. During the  
calendar year 1962, it became increasingly apparent  
that the worldwide population explosion had resulted  
in a rapid expansion of the fisheries on all of the  
world's oceans as many nations sought protein from  
the seas for their people. The efforts of the Bureau  
of Commercial Fisheries to utilize wisely the na-  
tion's fishery resources cover a wide range of ac-  
tivities, from basic research in fields such as fish-  
ery biology and fish oil technology to practical ap-  
plications such as demonstrations of fish cookery in  
schools and the dissemination of daily prices for  
fish landed in principal United States ports. The re-

port touches briefly on developments during 1962 in the domestic fisheries, Federal legislation pertaining to the industry, and international fishery matters. It also discusses principal Bureau accomplishments in fishery market promotion, products inspection, statistics collection, market news data, economic studies, vessel safety promotion, and other fields; financial assistance programs; shellfish genetic and fishery commodity studies; and cooperation with international, Federal, state, and other agencies. Included are discussions of the organization, employment, budget, and physical property of the Bureau; and publications written by its personnel. Appendixes contain statistics of United States fisheries; organizations with which the Bureau had contracts; and data on the Fisheries Loan Program.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL- 8 -	Portugal's Fishing Industry, 1963, 28 pp.
MNL-18 -	Panama's Fishing Industry, 1963, 9 pp.
MNL-57 -	Fisheries in the Federal Republic of Germany, 1963, 27 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

#### California Fishery Market News Monthly Summary,

Part I - Fishery Products Production and Market Data, June 1964, 15 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

#### California Fishery Market News Monthly Summary,

Part II - Fishing Information, July 1964, 9 pp., illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated. Includes an article, "Tagged bluefin tuna recovered off Japan."

#### California Fishery Products and Byproducts Brokers,

Importers, and Exporters, 1964, 8 pp., July 1964. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.)

#### (Chicago) Monthly Summary of Chicago's Wholesale

Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, June 1964, 18 pp. (Market News Service, U.S. Fish and Wildlife Service, U.S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

#### Gulf of Mexico Monthly Landings, Production and Ship-

ments of Fishery Products, June and July 1964, 8 pp., each. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, fin-

fish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the months indicated.

#### List of Primary Receivers of Imported Fishery Prod-

ucts and Byproducts at Houston, Tex., 1964, 2 pp., July 28, 1964. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.)

#### List of Primary Receivers of Imported Fishery Prod-

ucts at Miami, Fla., 1964, 3 pp., April 9, 1964. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.)

#### Monthly Summary of Fishery Products Production in

Selected Areas of Virginia, North Carolina, and Maryland, June 1964, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

#### New England Fisheries--Monthly Summary, June 1964,

22 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

#### New England Importers and Brokers of Imported Fish-

ery Products, November 1963, 9 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.)

#### New York City's Wholesale Fishery Trade--Monthly

Summary, May and June 1964, 19 pp., each. (Market News Service, U.S. Fish and Wildlife Service, 155 John St., New York, N.Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the months indicated.

#### New York City's Wholesale Fishery Trade, 1963 (In-

cluding Statistics and Marketing Trends), 47 pp. (Fishery Market News Service, U.S. Bureau of Commercial Fisheries, 155 John St., New York, N.Y.

10038.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York's wholesale Fulton Fish Market during 1963. The second section covers marketing trends and receipts in the fresh-water fish market (Peck Slip Area). The third part contains miscellaneous trends and developments: landings at Stonington, Conn., during 1963; monthly range of wholesale prices for fish meal, oil, and solubles at New York City, 1962/63. The fourth part presents a series of statistical tables giving receipts of fresh and frozen finfish and shellfish by species, states and provinces, and transport methods; imports at New York, 1962/63; receipts of finfish and shellfish by states; prices of fresh fishery products by months; and ex-vessel prices at Fulton Fish Market by species and months.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1964, 9 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ABALONE:

"Abalone. . . Where it's found, how to process it," article, *Fisheries Newsletter*, vol. 23, no. 6, June 1964, pp. 19, 27, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. Discusses distribution, harvesting, and processing of abalone. Designed to assist fishermen searching for the mollusc.

### AFRICA:

A Note on the Fisheries of Africa, 14 pp., printed, 1964. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. A paper prepared for the 6th Session of the United Nations Economic Commission for Africa, Addis Ababa, held February 19-March 3, 1964.

### AGAR-AGAR

"Preparation and properties of agar-agar from Indian seaweeds," by A. N. Kappanna and A. Visweswara Rao, article, *Chemical Abstracts*, vol. 59, August 19, 1963, 3717e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Soluble agar and carrageen gums," article, *Food Manufacture*, vol. 39, March 1964, p. 87, printed. Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

### ALASKA:

1963 Alaska Commercial Fisheries Catch and Production Statistics, by Philip E. Chittwood, Statistical Leaflet No. 7, 28 pp., printed, July 1964. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

### ALGAE:

Chemistry of Blue-Green Algae (CYANOPHYCEAE), by G. K. Barashkov, OTS 62-32780, 10 pp., printed, August 1, 1962, \$1.10. (Translated from the Russian, *Botanicheskii Zhurnal*, Akademiia Nauk SSSR, vol. 46, no. 3, pp. 447-454.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Chlorophyllase and Formation of an Atypical Chlorophyllide in Marine Algae, by J. Barrett and S. W. Jeffrey, 4 pp., illus., printed. (Reprinted from *Plant Physiology*, vol. 39, no. 1, January 1964, pp. 44-47.) Laboratory of Comparative Biology, Kaiser Foundation Research Institute, S. 14th St. and Cutting Blvd., Richmond, Calif.

### AMINO ACIDS:

"Fish and fish products. Part V--Quantitative estimation of essential amino acids in fish protein through ion-exchange resin columns and paper chromatograms," by N. A. Khan and Kh. M. Qudusur Rahman, article, *Scientific Researches*, vol. 1, no. 2, April 1964, pp. 88-95, illus., printed, single copy 65 cents. East Regional Laboratories, P.C.S.I.R., Mirpur Rd., Dhamondi, Dacca-2, East Pakistan.

### AQUARIUMS:

A Continuous Flow, Seawater Aquarium Suitable for Experimental Work With Live Marine Animals, by James E. Stewart and H. E. Power, Circular No. 13, 7 pp., illus., printed, 1963. Technological Research Laboratory, Fisheries Research Board of Canada, Halifax, N.S., Canada.

### ARGENTINA:

Foreign Trade Regulations of Argentina, by Walter Haidar, OBR 64-56, 8 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Argentina's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, United States foreign trade controls, and Government representation between the two countries.

### ATLANTIC OCEAN:

Scientific Conference on the Results of Oceanographic Investigations of the Atlantic Ocean, by K. A. Sedych, OTS 63-21758, 16 pp., printed, May 7, 1963, 50 cents. (Translated from the Russian, *Okeanologia*, vol. 3, no. 1, 1963, pp. 175-177.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

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#### AUSTRALIA:

"Navy and CSIRO co-operate to aid fisheries," article, *Fisheries Newsletter*, vol. 23, no. 5, May 1964, pp. 17, 19, illus., printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia. Describes the aims of Australian Navy oceanographic and survey cruises to be made this year. Gives details of the work being undertaken.

Tasmania Inland Fisheries Commission Report for the Year Ended 30th June 1962, 16 pp., printed 1962. Tasmania Inland Fisheries Commission, Hobart, Tasmania, Australia.

#### AUSTRIA:

Foreign Trade Regulations of Austria, by Catherine M. Kelley, OBR 64-57, 8 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Austria's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, United States foreign trade controls, and Government representation between the two countries.

#### BELGIUM:

Rapport Annuel sur l'Evolution de la Flotte de Peche en 1963 (Annual Report of the Status of the Fishing Fleet in 1963), 43 pp., processed in French. Administration de la Marine et de la Navigation Interieure, Ministere des Communications et des Postes, Telegraphes et Telephones, Brussels, Belgium.

#### BIBLIOGRAPHIES:

Preliminary Bibliography of Fish and Fisheries for Hong Kong and South China Sea, by A. Soulier, Occasional Paper 64/2, 13 pp., printed, 1964. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

#### BLACK SEA:

AZOV-Black Sea Scientific Research Institute of Marine Fishing and Oceanography, by I. O. Sakovets, OTS 63-21559, 28 pp., printed, April 10, 1963, 75 cents. (Translated from the Russian Rybnoe Khoz-iaistvo, vol. 36, no. 7, 1960, pp. 35-39.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### BLUEFISH:

"Bluefish--It's not a total mystery," by James R. Westman, article, *The Conservationist*, vol. 18, no. 6, June-July 1964, pp. 18-20, illus., printed. The New York State Conservation Department, State Campus, Albany, N. Y.

#### CALIFORNIA:

California Fish and Game, vol. 50, no. 3, July 1964, 97 pp., illus., printed, single copy 75 cents. Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Includes, among others, the following arti-

cles: "An ecological survey of a marine environment prior to installation of a submarine outfall," by Charles H. Turner, Earl E. Ebert, and Robert R. Given; "First records for the bigeye thresher (*Alopias superciliosus*) and slender tuna (*Allothenus fallai*) from California, with notes on Eastern Pacific scombrid otoliths," by John E. Fitch and William L. Craig, "California striped bass estimates for 1961," by Arnold B. Albrecht; "Weight-length relationship for bluefin tuna in the California fishery, 1963," by Robert R. Bell; and "1916, the pioneer year of tuna tagging on the Pacific Coast of North America," by Franklin G. Alverson and Bruce M. Chatwin.

#### CANADA:

The Canadian Fish Culturist, Issue 32, May 1964, 63 pp., illus., printed. Information and Consumer Service, Department of Fisheries of Canada, Ottawa, Canada. Includes articles on: "Flatworm problems in fish," by Reino S. Freeman; "Planting brook trout (*Salvelinus fontinalis*)--Mitchill in estuarial waters," by J. W. Saunders and M. W. Smith; "A retractable transducer for small boat echo sounding," by V. R. Taylor; "A false weir fishtrap," by K. H. Kupka; and "Return of pink salmon to Robertson Creek shows promise of success," by F. C. Boyd.

Fisheries Branch and Fishermen's Loan Board of New Brunswick Annual Report, 1963, 1 vol., printed, 1964. Fisheries Branch, Department of Industry and Development, N. B., Canada.

Fisheries Statistics, New Brunswick, 1962, 35 pp., illus., printed in French and English, July 1964, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Consists of tables giving the quantity and value of landings by species and districts of New Brunswick, 1961/62; quantity and value of products by species from 1950-1962; classification of fishing craft by tonnage, length, and type of gear used; number of fishermen in New Brunswick; new capital investment in the commercial fishery, 1961/62; and persons engaged in the major fisheries, 1961/62.

#### CHESAPEAKE BAY:

Chesapeake Science, vol. 5, nos. 1-2, March-June 1964, 105 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes articles on: "Eggs, larvae and young of the white perch, *Roccus americanus*, with comments on its ecology in the estuary," by Romeo J. Mansueti; "Early development of the yellow perch, *Perca flavescens*, by Alice Jane Mansueti; "Spawning of the cobia, *Rachycentron canadum*, in the Chesapeake Bay, with observations of juvenile specimens," by Edwin B. Joseph, John J. Norcross, and William H. Massmann; and "Modification and operation of the Gulf I-A high speed plankton sampler," by Robert E. Smith, Donald P. deSylva, and Richard A. Livellara.

#### CHINA:

Numerous Aquatic Products Found in Gulf of Peichili, by Cheng-chih Li, OTS 63-13537, 4 pp., printed, December 13, 1962, \$6.60. (Translated from the Chinese, Kuang-ming Jih-pao, Peiping, October 5, 1962, 2 pp.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

## CLAMS:

The Bay Clams of Oregon, by Lowell D. Marriage, Educational Bulletin No. 2, 29 pp., printed, 1958, Fish Commission of Oregon, Portland, Oreg.

"Proteins of shellfish. XI--Hydration of muscle of clam," by R. Baba, article, Chemical Abstracts, vol. 57, October 29, 1962, 11613f, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

## COD:

The Connection Between Hydrological Conditions and Fluctuations in the Abundance of Year Classes of Cod, by A. G. Kisliakov, 6 pp., processed, 1963. (Translated from the Russian, Akademiia Nauk SSSR, Ikhtiologicheskaya Komissiya, Trudy Soveshchani, no. 19, 1961, pp. 260-264.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

Some Data on the Feeding of the Barents Sea Cod GADUS MORHUA MORHUA L. in Experimental Conditions, by M. I. Tarvardieva, Translations No. 116, 19 pp., printed, 1963. (Translated from the Russian, Voprosy Ikhtologii, 1962.) Fisheries Laboratory, Department of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

## COLD-STORAGE:

"Cold storage of retail-packed fillets of mackerel and herring," by Arne Liljemark, article, Food Technology, vol. 18, no. 3, 1964, pp. 122-124, printed, The Garrard Press, 510 N. Hickory, Champaign, Ill.

## COMPOSITION:

Composition of Foods--Raw, Processed, Prepared, by Bernice K. Watt and Annabel L. Merrill, Agriculture Handbook No. 8, 192 pp., printed, revised December 1963, \$1.50, Consumer and Food Economics Research Division, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) In this edition, data previously published have been reexamined and values for some nutrients have been revised to take into account more recent findings. Many new foods have been added to the tables, bringing the total to about 2,500 items. New food products added include numerous kinds of nut, fish, and poultry items. In the section of notes on food is a short critical analysis of studies on the composition of fish.

## CONFERENCES:

"Conferencia da pesca da Europa Ocidental" (Western European fishery conference), by Armando de Oliveira Hagatong, article, Conservas de Peixe, vol. 19, no. 219, June 1964, pp. 18-19, 28, printed in Portuguese, Sociedade da Revista Conservas de Peixe, Lda., Regueira dos Anjos, 68, Lisbon, Portugal.

## CRABS:

How to Build--In Fifteen Easy Steps--a Crab Pot, 3 pp., illus., printed, Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130.

## CRAWFISH:

"Geographic variation in the crawfish *Faxonella clypeata* (Hay) with the definition and defense of the

genus *Faxonella* creaser (Decapoda, Astacidae)," by J. Fitzpatrick, article, Tulane Studies in Zoology, vol. 10, no. 1, 1963, pp. 37-79, illus., printed, Tulane University, P. O. Station 20, New Orleans 18, La.

## CROAKER:

Distribution and Abundance of Atlantic Croaker, MICROPOGON UNDULATUS, in South Carolina, by Charles M. Bearden, Contribution No. 40, 21 pp., illus., printed, June 1964, Bears Bluff Laboratories, Wadmalaw Island, S. C.

## CRUSTACEA:

"Moulting frequency of a deep-sea crustacean, *Euphausia pacifica*," by Reuben Lasker, article, Nature, vol. 203, no. 4940, July 4, 1964, p. 96, printed, single copy 4s. (about 55 U.S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

## DOLPHIN:

The Directional Characteristics of Delphinid Sounds, by W. E. Evans, W. W. Sutherland, and R. G. Beil, 20 pp., printed, 1963. (Reprinted from Marine Bio-Acoustics--Proceedings of a Symposium held at Bimini, Bahamas, April 1963, pp. 353-372.) Lockheed Aircraft Corp., Burbank, Calif.

"Electronics goes after the dolphin," by John L. Russell, Jr., article, The Aquarium, vol. 33, no. 8, August 1964, pp. 6-7, illus., printed, single copy 40 cents. Aquarium Publishing Co., P. O. Box 832, Norristown, Pa. Discusses the work of the Communication Research Institute, first research facilities in the world devoted strictly to the study of dolphins. Deals particularly with speech capabilities of the dolphin.

## DRIED FISH:

"Kusaya--no-himono (Rotten dried fish)," by Yasukazu Terada and Takeo Kametania, article, Chemical Abstracts, vol. 58, April 1, 1963, 7298b, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

## DRYING:

"The use of a pyrethrum dip as protection for drying fish in Uganda," by R. H. McCellan, article, Chemical Abstracts, vol. 60, March 16, 1964, 7363c, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

## ECHO-SOUNDERS:

An Introduction to Echosounding, 144 pp., illus., printed, \$1. Brown & Ross, Inc., 17 Battery Pl., New York, N. Y. 10004. For more than a quarter century, the echo-sounder has been an indispensable aid to navigators. Its ability to supply depth measurements in practically all weather without impeding the crew's activities gives it a distinct advantage over the earlier lead-line sounding technique. This feature has made it invaluable for finding the ship's position and has reduced the risk involved in maneuvering near coastal and shoal waters. With echo-sounders, trawlers can fish along shelving coasts and banks once considered too dangerous for their operation. This booklet discusses in detail the operation of a German echo-sounder. Includes chapters on sound--its physical characteristics; echos; effect of fish schools on an echo; reasons for using ultrasound; sounding technique and sounder principles; graph indication; in-

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terpretation of indications; indication of fish; and fish detecting with horizontal sounders. Also includes a number of photos showing recordings or "echograms" made by the echo-sounder.

#### EELS:

"Hemoglobins from erythrocytes of eel, *Anguilla japonica*," by Kinzaburo Hamada and others, article, *Journal of Biochemistry*, vol 55, February 1964, pp. 154-162, printed, The Japanese Biochemical Society, c/o Dept. of Biochemistry, Faculty of Medicine, Tokyo University, Bunkyo-ku, Tokyo, Japan.

#### EXPORTS:

Financial Procedures under Public Law 480--Emphasis on Titles I and IV of the Agricultural Trade Development and Assistance Act, by John P. Bogumill and O. Halbert Goolsby, Foreign Agricultural Economic Report No. 17, 22 pp., illus., processed, May 1964, Economic Research Service, Development and Trade Analysis Division, U.S. Department of Agriculture, Washington, D. C. 20250. Explains the usual financial procedures used in transactions under Titles I and IV of the Agricultural Trade Development and Assistance Act of 1954 (P.L.-480). Emphasis is placed on the international financial procedures employed in these programs and on the fiscal movement and accounting of United States-owned foreign currencies in the U. S. Department of the Treasury. Also presents a view of an entire P. L. 480 program, from the acquisition of surplus agricultural products to final sale of the products to a foreign country and the subsequent utilization of the currencies paid.

#### FISH BEHAVIOR:

A Study of the Behaviour of Fishes in the Zone of Action of Fishing Gear, by N. E. Aslanova, Translations No. 113, 26 pp., printed, 1963. (Translated from the Russian, VNIRO, 1958.) Fisheries Laboratory, Department of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

#### FISH DISEASES:

"Some comments on the causes of disease in the carp *Cyprinus carpio* L. in the Volga delta," by V. G. Strokina, article, *Problems of Ichthyology*, 1963, vol. 1, no. 26; Selected Articles, OTS 63-21781, printed, \$1.50. (Translated from the Russian, *Voprosy Ikhtologii*, vol. 3, no. 1 (26), 1963, pp. 171-176.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### FISHERIES RESEARCH:

Progress Report on the Work of the Torry Research Station, Aberdeen, Scotland and of the Humber Laboratory, Hull, England, Torry Miscellaneous Paper No. 3, 7 pp., printed, 1959. Torry Research Station, Aberdeen, Scotland.

#### FISHERY CAREERS:

"Careers in fish and game management," by W. Manson Lawrence, article, *The Conservationist*, vol. 18, no. 6, June-July 1964, pp. 28-30, illus., printed, The New York State Conservation Department, State Campus, Albany, N. Y.

#### FISH FILLETS:

Antibiotic Dips for Preserving Fish Fillets, by C. H. Castall and J. Dale, Bulletin No. 138, 70 pp., illus.,

printed, 1963. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

#### FISH MEAL:

"Method for extraction of herring meal for manufacture of meal, being particularly deficient in fat," article, *Norwegian Patent Claims in English Translation*, June 4, 1962, no. 39721, printed, \$1.85. A. Capelo, P. O. Box 46354, Hollywood 46, Calif.

#### FISH OILS:

"Fatty oils from shellfish," by Hisanao Igarashi, Koichi Zama and Kozo Takama, article, *Chemical Abstracts*, vol. 58, February 18, 1963, 3519d, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### FISH POPULATIONS:

"On the effect of feeding conditions on a fish population," by M. V. Zheltchenkova, article, *Population Dynamics of Marine Fishes*, vol. 34, 1958, 37 pp., processed, 1959. (Translated from the Russian *Trudy Vsesoiuznyi, N.-I. Institut Morskogo Rybnogo Khozaistva i Okeanografii*, vol. 34, 1958, pp. 102-126.) Biological Station, Fisheries Research Board of Canada, St. John's, N. B., Canada.

The Principles of Mathematical Representation of the Dynamics of Commercial Populations of Fish (*Printsip matematicheskogo modelirovaniia dinamiki promyslovnykh populatsii ryb*), by V. S. Ivlev, 14 pp., processed, 1963. (Translated from the Russian, *Akademii Nauk SSSR, Ikhtologicheskaiia Komissia, Trudy Soveshchaniia*, no. 13, 1960, pp. 185-193.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

#### FISH SOUNDS:

Sonic Characteristics and Mechanisms in Marine Fishes, by W. N. Tavolga, 17 pp., printed, 1963. (Reprinted from *Marine Bio-Acoustics--Proceedings of a Symposium held at Bimini, Bahamas, April 1963*, pp. 195-211.) The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y.

#### FOOD ADDITIVES:

"Carrageenan, a useful food additive," by Otto Christensen, article, *Food Manufacture*, vol. 39, March 1964, pp. 44-47, printed, Leonard Hill, Ltd., Stratford House, 9 Enden St., London NW1, England.

#### FOOD AND AGRICULTURE ORGANIZATION:

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

First Report to the Government of Pakistan on Trawling Operations in the Bay of Bengal, December 1962 to April 1963, by Kenneth H. Bain and G. Illugason, FAO Report No. 1767, 35 pp., printed, 1964.

#### FOOD POISONING:

"Effect of sodium alginate on *Staphylococcus aureus* during mild heating and freezing," by Lelia G. Scott

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

and Dorothy H. Strong, article, Applied Microbiology, vol. 12, March 1964, pp. 146-149, printed. Williams and Wilkins, Mt. Royal and Guilford Aves., Baltimore 2, Md.

#### FREEZE-DRYING:

"Lipid oxidation and protein denaturation in freeze-dehydrated fish," by M. Toyomizu, Y. Matsumura and Y. Tomiyasu, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 9, 1963, pp. 854-859, illus., printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### FROZEN STORAGE:

Hranenie Zamorozhenoi Ryby (Frozen Storage of Fish), by A. I. Piskarev and others, 56 pp., illus., printed in Russian, 1963, Gostorgizdat, Moscow, U.S.S.R.

#### GENETICS:

Bionics and Fishing, U.S.S.R., by V. I. Tsvetkov and V. R. Protasov, OTS 64-31057, 4 pp., printed, April 1964, 50 cents. (Translated from the Russian, Priroda, vol. 53, no. 2, 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### GERMAN FEDERAL REPUBLIC:

Foreign Trade Regulations of the Federal Republic of Germany, by Margot W. Zener, OBR 64-55, 12 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses West Germany's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. The report also covers special customs provisions, nontariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries.

#### GREAT LAKES:

"Great Lakes research," by E. E. J. Fry and G. K. Rodgers, article, Science, vol. 145, no. 3631, July 31, 1964, p. 516, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### GREENLAND SEA:

The Oceanographic Expedition to the Greenland Sea on the Diesel-Electric Ship "Lena" in 1958, by V. A. Shamont'ev, OTS 61-13977, 20 pp., printed, 1961, \$1.60. (Translated from the Russian, Problemy Arktiki, no. 6, 1959, pp. 124-127.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### GULF OF MEXICO:

The Gulf of Mexico Menhaden Fishery in Relation to the Sports Fisheries, by Gordon Gunter, ML 64202, 10 pp., printed, 1964. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Sixteenth Annual Session, November 1963, pp. 99-108.) Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans, La. 70112.

#### HAKE:

"Bacterial spoilage of hake," by E. Lamprecht and M. de Villiers, article, Annual Report 1962, Fishing Industry Research Institute, pp. 16-17, printed. Fishing Industry Research Institute, Cape Town, South Africa Republic.

"Discolouration of hake by moulded cartons," by A. Atkinson, article, Annual Report 1962, Fishing Industry Research Institute, pp. 17-18, printed. Fishing Industry Research Institute, Cape Town, South Africa Republic.

"Effect of delay in freezing hake," by A. G. Pienaar, article, Annual Report 1962, Fishing Industry Research Institute, p. 19, printed. Fishing Industry Research Institute, Cape Town, South Africa Republic.

"Rapid chilling of hake," by G. M. Dreosti and C. K. Simmons, article, Annual Report 1962, Fishing Industry Research Institute, pp. 14-16, illus., printed. Fishing Industry Research Institute, Cape Town, South Africa Republic. The Institute investigated the effects of slow and delayed chilling on the quality of hake in order to estimate the benefits of more rapid chilling. It also investigated other means or rapid chilling in bulk of freshly-caught fish. Headed and gutted hake were laid down in crushed ice under controlled conditions on board a trawler at sea and three days later samples were transferred to the Fishing Industry Research Institute where they were kept in single layers of flake ice for storage tests. The quality of the fish was assessed by the F.I.R.I. standard odor test. The results showed that the total storage life from catching of hake could be extended from 8-10 days to 11 to 12 days by rapid chilling immediately after landing on deck providing the fish were not bruised. The Institute also tested a method of chilling headed and gutted hake in bulk by recirculating chilled brine through a vertical cylindrical container containing the fish. Circulating velocities were investigated and rapid cooling was obtained when the upward velocity through the container was such that the fish tended to float. The results showed that this method gave more rapid cooling than standard methods of icing in single layers.

#### HERRING:

The Distinction and Similarity in the Biological Characters of the White Sea and Baltic Herring, by N. A. Dmitriev, OTS 61-31039, 8 pp., printed, 1961, 50 cents. (Translated from the Russian, Vsesoiuznyi Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografi, vol. 34, 1958, pp. 178-184.) Office of Technical Service, U. S. Department of Commerce, Washington, D. C. 20230.

The First Cruise of the Research Exploratory Expedition of the Polar Institute of Marine Fisheries and Oceanography into the North-Western Atlantic (Summer 1960), in a Search for Herring (Pervyi reis nauchno-poiskovoi sel'dianoi ekspeditsii PINRO v severno-zapadnuiu Atlantiku letom 1960g), by I. G. Iudanov, Translation 736, 2 pp., processed, February 1962. (Translated from the Russian, Okeanologia, vol. 1, no. 4, 1961, pp. 756-757.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Occurrence of thiaminase in Baltic herring," by Taina Kuusi, article, *Chemical Abstracts*, vol. 59, October 28, 1963, 10504a, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

On the Stock of Spring Herring in Hokkaido, by Morisaburo Tauchi, OTS 60-17439, 6 pp., printed, 1960, \$1.10. (Translated from the Japanese, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 13, no. 5, pp. 207-209, 1948.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### ICELAND:

"Cod fishing off Iceland," by John Jonsson, article, *Iceland Review*, vol. 2, no. 1, 1964, pp. 7, 9-10, illus., printed, single copy 40 Kr. (about 95 U.S. cents). *Iceland Review*, P.O. Box 1238, Reykjavik, Iceland.

#### ICHTHYOLOGY:

Deep-Sea Fishes, by O. N. Kiselev, OTS 63-21455, 5 pp., printed, March 29, 1963, 50 cents. (Translated from the Russian *Priroda*, no. 12, 1962, pp. 96-98.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

Problems of Ichthyology, 1961, vol. 3, no. 20, OTS 62-21612, 44 pp., printed, April 18, 1963, \$1.25. Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### IMPORTS:

Changes in Presentation of U.S. Import Statistics Effective (Notice to Users of the Census Report FT 125--Formerly FT 110 and FT 120), 1964, 127 pp., processed, April 1964. Bureau of the Census, U.S. Department of Commerce, Washington, D. C. 20233. Effective with the data for February 1964, significant changes have been inaugurated by the Bureau of the Census in the compilation and publication of import data which are of special interest to users of data formerly issued in report series FT 110 and FT 120. Those reports have been consolidated and redesigned and will be issued in report series 125. This brochure describes the scope and arrangement of the new report, furnishes a copy of Schedule A (Revised), and announces the availability of certain classes of data by special subscription.

United States Imports of Merchandise for Consumption (Commodity by Country of Origin), 1963 Annual, Report FT 110, 451 pp., processed, June 1964, \$1.00. Bureau of the Census, U.S. Department of Commerce, Washington, D. C. 20230. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.) Import statistics include government as well as nongovernmental shipments of merchandise (including fish, shellfish, and fishery byproducts) from foreign countries.

#### INDIA:

Fish Technology Newsletter, vol. 5, no. 1, April 1964, 19 pp., illus., processed, Central Institute of Fisheries Technology, Ernakulam, India. Includes, among others, the following articles: "Canning of sardines," "Freezing of frog legs," "Fishery products of commerce. II--Fish ensilage," and "Boat

building. I--Fastenings: typical fastenings for boat building."

#### INLAND WATERWAYS:

America's Waterways, 31 pp., illus., printed, 1964. Touring Service, Mobil Oil Company, 150 E. 42nd St., New York, N. Y. 10017. Boatmen want to know not only where to cruise, but where they may obtain charts of the selected areas, what the points of interest are, and where sailing ships and nautical museums may be found. The first part of this pamphlet lists the sources of most of the Government charts and publications. Part 2 contains the listing of some of America's better known waterways. Each state has its own and there are hundreds. Part 3 discusses each of 27 historical ships and museums. Part 4 is a listing of the states and Canadian provinces with their official sources of information on recreational areas.

#### INTERNATIONAL COMMISSIONS:

In the International Council on Investigation of the Sea, OTS 63-21280, printed, March 8, 1963, 50 cents. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 38, no. 11, 1962, p. 93.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### IRELAND:

Foreign Trade Regulations of Ireland, by Edward A. Leslie, OBR 64-64, 8 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.) Discusses Ireland's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. The report also covers special customs provisions, non-tariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries. The import of some fishery products into Ireland is regulated by Government authorities.

#### ISLE OF MAN:

Marine Fauna of the Isle of Man and its Surrounding Seas, edited by J. R. Bruce, J. S. Colman, and N. S. Jones, L. M. B. C. Memoir no. 36, 316 pp., illus., printed, 1963, £3 3s. (about US\$8.82). Liverpool University Press, 123 Grove St., Liverpool 7, England.

#### ITALY:

"More stockfish for Italy," article, *Iceland Review*, vol. 2, no. 1, 1964, p. 15, illus., printed, single copy 40 Kr. (about 95 U.S. cents). *Iceland Review*, P.O. Box 1238, Reykjavik, Iceland.

#### JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 4, February 1964, 83 pp., illus., printed in Japanese with English abstracts and tables. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Includes, among others, the following articles: "Freeze vacuum drying of marine products. (III) Test on salmon meat," by Kiichiro Kobayashi and Shuzo Igarashi; "Studies on the fluorescent color-lamp for attracting of fish. (II) Under-water distribution of color density and the fish-schools aggregate."

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gated," by Toshiro Kuroki, Hiroshi Nakayama, and Kiyohisa Ueno; "Lipids of salmonoid fishes. (VII) Cephalin from liver of salmon, *Oncorhynchus masou*," by Koichi Zama, Mutsuo Hatano, and Hisanao Igarashi; "Studies on complete utilization of squid (*Ommastrephes sloani pacificus*). (XX) Manufacture of smoked squid meat (2)," by Eiichi Tanikawa, Minoru Akiba, and Terushige Motohiro; and "Studies on pteolytic enzymes of salmon pyloric caeca. (I) Partial purification and some properties," by Katsujir Yoshimura, Takeshi Shibata, and Hiroshi Ushiyama.

"Japan: An underwater research vessel," article, New Scientist, vol. 21, March 26, 1964, p. 819, printed, Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

Suisan Jiho, nos. 11-12, 1963, 72 pp., illus., printed in Japanese. Agricultural and Fisheries Association, Tokyo, Japan. Contains these articles: "Fisheries policies in the North European countries," by Akira Arimatsu; "Abnormal conditions on fishes due to abnormal cold waves;" "Artificial hatching and stocking of salmon and trout in Sakhalin-Sano;" "Outline of port and harbor facilities;" and "Bottom fish resources in the Northeast Area of Hokkaido."

#### KOREA:

Investment Factors in the Republic of Korea, by Joyce C. Bachmann, OBR 64-58, 16 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A report of interest to businessmen considering an investment in the Republic of Korea. Korea offers a generally favorable Foreign Investment Encouragement Law, reinforced by the investment guaranty program of the U. S. Agency for International Development (AID). The report discusses prospects for and Government policy toward foreign investment; Government controls over industry; business organization; and taxation problems. Also covers capital availability and credit, labor conditions, basic economic facilities, and investment services. The text of the Foreign Investment Encouragement Law is included.

#### LAKE BAIKAL:

Lake Baikal and its Life, by M. Kozhov, Monographiae Biologicae, vol. 11, 351 pp., illus., printed, 1963, \$10. Dr. W. Junk, The Hague, Netherlands.

#### MACKEREL:

"Chemical composition of mackerel (*Rastrelliger canagurta*) and changes in the nutritive value during storage," by D. J. Nazir and N. G. Magar, article, Indian Journal of Technology, vol. 1, no. 6, 1963, pp. 247-249, printed, Indian Journal of Technology, Hillside Rd., 12, Delhi, India.

#### MARINE AIDS:

Light List, Vol. V--Mississippi River System, 293 pp., illus., printed, 1964, \$1.75. U. S. Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Contains a list of lights, fog signals, buoys, and daybeacons for the Mississippi River System of the United States, Second Coast Guard District.

#### MARINE ALGAE:

Excretion of Colored Ultraviolet-Absorbing Substances by Marine Algae, by J. S. Craigie and J. McLachlan, 11 pp., printed, 1964. (Reprinted from Canadian Journal of Botany, vol. 42, 1964, pp. 23-33.) Atlantic Regional Laboratory, Halifax, N. S., Canada.

Marine Red Algae of Pacific Mexico. Part 8--Ceramiales: Dasycaceae, Rhodomelaceae, by E. Yale Dawson, 81 pp., printed, 1963. (Reprinted from Nova Hedwigia, vol. 4, no. 3, 1963, pp. 401-481.) Beaudette Foundation for Biological Research, Solvang, Calif.

#### MARINE MAMMALS:

"Los danos que causan los animales marinos depredadores en el Mediterraneo" (The damage caused by the predaceous marine mammals of the Mediterranean), by M. Ravel, article, Puntal, vol. 11, no. 122, May 1964, pp. 2-5, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

#### MARYLAND:

"Several Maryland fishes are close to extinction," by Frank Schwartz, article, Maryland Conservationist, vol. 41, no. 3, May-June 1964, pp. 8-12, illus., printed, single copy 25 cents. Department of Game and Inland Fish, State Office Bldg., Box 231, Annapolis, Md. An account of nine freshwater forms and eight marine fishes whose abundance and presence have been drastically altered or eliminated by the effects of pollution sedimentation and drainage in Maryland. Among the marine fish mentioned are: sturgeon, shad, croaker, gray sea trout or weakfish, sheepshead, Spanish mackerel, and king whiting or kingfish.

#### MEETINGS AND PROCEEDINGS:

Proceedings of the Conference on Primary Productivity Measurement, Marine and Freshwater Held at University of Hawaii, August 21-September 6, 1961, edited by Maxwell S. Doty, 237 pp., illus., printed, 1961. University of Hawaii, Honolulu, Hawaii.

#### MOLLUSCS:

Molluscs, by John Edward Morton, 232 pp., illus., printed, 1960. Harper and Bros., 49 E. 33rd St., New York, N. Y.

"Molluscs," by Alan J. Kohn, article, Science, vol. 145, no. 3631, July 31, 1964, p. 518, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington, D. C. 20005. Sensory, integrative, and effect or aspects of the responses of marine gastropods, cephalopods, and bivalves to significant aspects of environment were emphasized in a symposium on the molluscs. Discusses papers presented at the symposium.

#### MUSSELS:

Comparison of the growth of mussels (*MYTILUS EDULIS*) in the White Sea and Sea of Okhotsk, by A. I. Savilov, OIS 82-25386, 13 pp., processed, 1962, \$1.60. (Translated from the Russian, Akademiia Nauk SSSR, Trudy Instituta Okeanologii, vol. 11, 1964, pp. 246-257.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

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## NETS:

"Improving fishing nets made from synthetic materials," by K. P. Grinevich and others, article, Soviet Plastics, no. 11, 1960, pp. 16-17, printed. (Translated from the Russian Plasticheskie Massy, no. 11, 1960, pp. 18-19.) Palmerton Publishing Co., Inc., 101 W. 31st St., New York 1, N. Y.

Mono-Filament Gill Netting for Skipjack (Striped Tuna), 7 pp., processed, 1963. Hakodate Fishing Nets Mfg. Co. Ltd., 82, Seuhio-cho, Hakodate, Japan.

## NICARAGUA:

Foreign Trade Regulations of Nicaragua, by Rodney D. Anderson, OBR 64-82, 8 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Nicaragua's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. The report also covers special customs provisions, nontariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries.

## NORWAY:

Norway Exports, no. 2, Summer 1964, 79 pp., illus., printed. Export Council of Norway, H. Heyerdahls Gate, Oslo 1, Norway. Some aspects of Norway's fish processing industry, fishery byproducts, trawler-building yards, and export of vessels are featured in this issue. Canned fish, frozen filets, margarine from fish oil, edible oil processing and use in canning, and 100 years of Norwegian whaling are all discussed. The delivery of seven complete fish meal plants to Chile is highlighted, as well as the construction and delivery of fishing vessels to Ghana and Kuwait.

## NUTRITION:

"Metabolizable energy values and coefficients of digestibility for protein and fat of starfish meal and starfish meal combined with fish meal," by M. W. Stutz and L. D. Mettersson, article, Poultry Science, vol. 43, March 1964, pp. 474-478, printed. Poultry Science Association, Kansas State College, Manhattan, Kans.

## OCEANOGRAPHY:

Oceanic Observations of the Pacific, 1951, 635 pp., printed, 1963. University of California Press, Berkeley, Calif.

Oceanic Observations of the Pacific, 1956, 502 pp., printed, 1963. University of California Press, Berkeley, Calif.

Oceanographic Work of the Pacific Marine Fisheries and Oceanography Institute's Soviet-Viet Nam Scientific Explorative Expedition (Razlichie i skhodstvo biologicheskikh priznakov Belomorskikh sel'dei i Baltiiskoi salaki), by P. I. Dolgikh and N. A. Shurinov, OTS 63-21438, 36 pp., printed, March 20, 1963, \$1.00. (Translated from the Russian, Okeanologiya, vol. 2, no. 2, 1962, pp. 368-371.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Pacific Ocean Scientific Research Institute of Marine Fishing and Oceanography (Tikhookeanskii nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii--TINRO), by A. G. Kaganovskii, OTS 63-21559, 28 pp., printed, April 10, 1963, 75 cents. (Translated from the Russian Rybnoe Khoziaistvo, vol. 36, no. 7, 1960, pp. 23-26.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

## OREGON:

Natural Resources of Oregon, 71 pp., illus., printed, 1964, 50 cents. Office of the Secretary, Division of Information, U. S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.) Chapters in this booklet describe Oregon's history, physical characteristics, fish and wildlife, water and power, forests, agriculture, minerals, parks and recreation opportunities, Indians, and programs of Federal natural resource agencies in the State. The publication also profiles the industries, scenic beauty, and population which contribute to the State's resource potential. In reference to fisheries, mentions in particular salmon, trout, and spiny-rayed fish. Discusses the cooperative programs of the State of Oregon and the U. S. Fish and Wildlife Service for enhancing the quality and abundance of the State's fish. Illustrative photographs accompany each article.

## OYSTERS:

Notes on the Biology and Commercial Use of the Chilean Oyster, by Luis Castillo and Zacarias Vergara, Translation Series No. 360, 29 pp., processed, 1961. (Translated from the Spanish, Apuntes Biologicos e Industrias sobre la Ostra de Chile, Ministerio de Industria, Santiago, Chile, 1962, 59 pp.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada.

## PACIFIC OCEAN:

Certain Laws Governing the Dynamics of the Abundance of Commercial Fish in the North-Western Part of the Pacific Ocean, by P. A. Moiseev, Translations No. 108, 2 pp., printed, 1963. (Translated from the Russian, Trudy Soveshchaniy, 1961.) Fisheries Laboratory, Department of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

## PENNSYLVANIA:

Pennsylvania Fishes, 35 pp., illus., printed, 1964. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Contains 17 color photos and brief descriptions of fish found in Pennsylvania waters. Describes for each fish its range, characteristics, habits, and food. In addition, six species are illustrated with drawings. Discusses the trout, pike, catfish, perch, and sunfish families; and distinguishing Pennsylvania fishes.

## PHYSIOLOGY:

"Behavior of dehydrogenase, erythrocytes, marrow and the crystalline lens of fish frozen at -8°," by Stefano Caracciolo and Constantino Petris, article, Chemical Abstracts, vol. 60, February 3, 1964, 3309e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Behavior of dehydrogenases in fish products frozen at  $-30^{\circ}$ ," by Stefano Caracciolo and Guglielmo Pepe, article, Chemical Abstracts, vol. 60, February 3, 1964, 3421d, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### PLANKTON:

Marine Plankton--A Practical Guide, by G. E. Newell and R. C. Newell, 207 pp., illus., printed, 1964, Hutchinson's Biological Monographs, 178-202 Great Portland St., London W1, England.

#### POISONOUS FISH:

"Poison fish projects report," article, South Pacific Bulletin, vol. 14, no. 2, April 1964, pp. 51-54, illus., printed, single copy 30 cents. South Pacific Commission Publications Bureau, C.P.O. 5254, Sydney, Australia. Discusses investigations of ciguatera (toxic fish poisoning) in the Pacific since 1958. Covers the biology of the red snapper, considered to be the most consistently toxic fish in the tropical Pacific; food chain transmission of the toxin; toxins of other species of fish; chemical analyses of various toxins; pharmacology; native remedies; and epidemiology of ciguatera.

"Poisons from shellfish and puffer fish," by Edmund F. Murtha, article, Chemical Abstracts, vol. 60, February 17, 1964, 4501f, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### POLAND:

"Statki rybackie dla malych portow polskiego wybrzeza" (Fishing vessels for Poland's small fishing harbors), by Bohdan Pradzynski, article, Budownictwo Okretowe, vol. 9, no. 5, May 1964, pp. 163-165, printed in Polish with English abstract. Budownictwo Okretowe, Wydawnictwa Czasopism Technicznych NOT, Warsaw, Czackiego 3/5, Poland. Discusses the fishing vessels to be operated in the future from Poland's small fishing harbors, the trends of the investment policies, and the characteristics of the fishing vessels needed.

#### POPULATION DYNAMICS:

Breeding, Population, Dynamics, and Health of Fish, U.S.S.R., OTS 64-31188, 59 pp., illus., printed, April 30, 1964, \$1.50. (Translated from the Russian, Voprosy Ikhtologii, vol. 4, no. 1 (30), 1964.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

#### PROCESSING:

"Lunenburg's dream-plant comes true," by Allan T. Muir, article, Canadian Fisherman, vol. 51, no. 7, July 1964, pp. 10-16, illus., printed, single copy C\$1. National Business Publications Ltd., Gardenvale, Que., Canada. The fish processing plant at Lunenburg, Nova Scotia, opened on June 24th, is discussed in this article. The new plant has a capacity of 80 million pounds of processed products annually. It also features push-botton systems for remote control of some operations in distant areas of the plant. The article covers the layout of the plant, the freezers, a pan-washing machine, the cooking and breadng kitchen, and smoked fish operation. Also discusses a unique system for separating lean from oily fish offal. The fish meal plant, ice-handling operation,

power plant, sea-water pumping station, employees' facilities, and other features of this new plant.

#### PROTEIN CONCENTRATE:

"Evaluation of the protein quality of some fish flours by determination of 'available' lysine and by bacteriological examination," by H. N. De, article, Scientific Researches, vol. 1, no. 2, April 1964, pp. 123-126, printed, single copy 65 cents. East Regional Laboratories, P.C.S.I.R., Mirpur Rd., Dhamondi, Dacca-2, East Pakistan.

#### QUALITY:

A New Quick Electronic Method of Determining the Freshness of Sea Fish, by C. Hennings, 44 pp., printed, 1963. (Translated from the German, Zeitschrift der Lebensmittel-Untersuchung und Forschung, vol. 119, April 1963, pp. 461-477.) Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

"Texture change in fish and its measurement," by R. M. Love, article, Texture in Foods, Torry Memoir no. 39, pp. 109-118, printed, Torry Research Station, Aberdeen, Scotland.

#### RADIATION PRESERVATION:

Application of Radiation-Pasteurization Process to Pacific Crab and Flounder--Final Summary for the Period November 1962 to November 1963, by D. M. Miyauchi and others, Report No. TID-19585, 152 pp., printed, November 1963, \$3.50. Division of Isotopes Development, U.S. Atomic Energy Commission. (Available from Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.)

"Enzyme-inactivation studies on irradiation-sterilized cod filets," by R. O. Sinnhuber and M. K. Landers, article, Journal of Food Science, vol. 29, no. 2, 1964, pp. 190-191, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Irradiation helps fish industry," by R. Seiden, article, Food Manufacture, vol. 39, March 1964, p. 51, printed. Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

"Packaging radiation-sterilized foods," article, Food Processing, vol. 25, March 1964, pp. 86-87, 98, printed. Putnam Publishing Co., 111 East Delaware Pl., Chicago 11, Ill.

Study Report Shipboard Cobalt-60 Radiopasteurizer for Marine Products, 61 pp., illus., printed, 1963. Brookhaven National Laboratory, Associated Universities, Inc., Upton, Long Island, N. Y.

#### RADIOACTIVITY:

"Radioactivity and its relationship to oceanic food chains," by Charles Osterberg, William G. Pearcy and Herbert Curl, Jr., article, Journal of Marine Research, vol. 22, no. 1, January 15, 1964, pp. 2-12, illus., printed, \$3.50. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn.

#### ROCKFISH:

Life History Studies on Ten Species of Rockfish (Genus SEBASTODES), by Julius B. Phillips, Fish Bulletin

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

126, 69 pp., illus., printed, 1964. Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Discusses importance of the fishery, materials and methods used in this study, weight-length relationships, age changes, reproduction, feeding habits, and racial studies. Also describes in detail the 10 species studied: the bocaccio; the chilipepper; and the yellowtail, canary, vermillion, widow, dark-blotched, splitnose, stripetail, and shortbelly rockfish.

#### SALMON:

Feeding of Young Salmon, SALMO SALAR L. Raised in Ponds [in Early Developmental Stages, by J. B. Bogdanova, JPRS 19772, 7 pp., printed, 1962. (Translated from the Russian, Voprosy Ikhtologii, vol. 2, no. 1 (22), pp. 169-173.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

High-Seas Salmon Fishing and Tagging by Canadian Vessels in 1963, by F. Neave and others, Manuscript Report Series No. 766, 23 pp., illus., printed, 1964. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

Preliminary Study of Scale Characteristics to Identify the Origin of Sockeye Taken by Long-Lining in the Gulf of Alaska during April and May, 1962, by H. T. Bilton and M. P. Shepard, Manuscript Report Series No. 757, 31 pp., illus., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Nekotorye dannye po vozvratu semgi ot izvestnogo chisla proizvoditelei" (Some data on return of salmon stemming from known numbers of brood fish), by V. V. Azbelev, article, *Biological Abstracts*, vol. 44, no. 3, 1963, 9238, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

"Nerestovaya migratsiya gorbushy v 1961" (Spawning migration of pink salmon—*Oncorhynchus gorbuscha*—in 1961), by V. V. Azbelev, article, *Biological Abstracts*, vol. 43, no. 3, 1963, 8641, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

"A note on scales of the chum salmon and allied species," by Keiichi Kondo and Mitsuru Kitahara, article, *Bulletin of Tokai Regional Fisheries Research Laboratory*, vol. 33, 1962, pp. 1-10, printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

Observations on the Movements of Atlantic Salmon (SALMO SALAR L.) in the River Conon and the River Meig, Ross-shire, I., by K. A. Pyefinch, Freshwater and Salmon Fisheries Research 31, 24 pp., printed, 1963. Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland.

Olfactory Perception in Juvenile Salmon. II--Conditioned Response of Juvenile Sockeye Salmon (ONCORHYNCHUS NEKKA) to Lake Waters, by J. R. McBride, and others, Reprint No. 762, 4 pp., printed. (Reprinted from *Canadian Journal of Zoology*, vol. 42, 1964, pp. 245-248.) Division of Administration, National Research Council, Sussex St., Ottawa, Canada.

Progress Report on Canadian Studies on Chum Salmon Scales for 1962, by H. T. Bilton, Manuscript Report

Series (Biological) No. 758, 4 pp., illus., printed, 1963. Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., Canada.

"Quality of the spawning bed as it relates to survival and growth of pink salmon embryos and alevins and time of fry emergence," by William J. McNeal, article, *Proceedings of the XVI International Congress of Zoology*, vol. 1, 1963, p. 242, printed. Permanent Committee of International Zoological Congresses, Secretary (Pierre Grasse), 105 Blvd. Raspail, Paris 6, France.

The Rational Decision Process in Salmon Migration, by Bernard C. Patten, 8 pp., printed. (Reprinted from *Journal du Conseil International pour l'Exploration de la Mer*, vol. 28, no. 3, 1964, p. 410-417.) Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, Va.

Report of Limited Salmon Tagging Operations, North Side Alaska Peninsula, 1961, by Daniel P. Hennick, Informational Leaflet No. 42, 8 pp., illus., processed, June 1, 1964. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

Salmon of the North Pacific Ocean. Part I--Catch Statistics for North Pacific Salmon, by Hiroshi Kasahara, article, *Bulletin No. 12*, 84 pp., illus., printed, 1963. International North Pacific Fisheries Commission, 6640 NW Marine Dr., Vancouver 8, B. C., Canada. This is an annotated compilation of catch statistics for salmon (genus *Oncorhynchus*) in the North Pacific. The principal purpose of the compilation is to present information on the amounts of various species of salmon that have been taken in that area during the past 50 years.

"Some aspects of the retinal physiology of salmon (*Salmo salar*)," by M. A. Ali, article, *Proceedings of the XVI International Congress of Zoology*, vol. 2, 1963, p. 70, printed. Permanent Committee of International Zoological Congresses, Secretary (Pierre Grasse), 105 Blvd. Raspail, Paris 6, France.

"Ustoichivost' molodi semgi k razlichnoi solenosti vody" (Tolerance of young salmon (*Salmo salar*) to various degrees of water salinity), by N. V. Koroleva, article, *Biological Abstracts*, vol. 43, no. 5, 1963, 17592, printed. *Biological Abstracts*, 3815 Walnut St., Philadelphia 4, Pa.

Utilization of Lipids by Fish. II--Fatty Acid Oxidation by a Particulate Fraction from Lateral Line Muscle, by E. Bilinski and R. E. E. Jones, Collected Reprint 832, 8 pp., illus., printed. (Reprinted from *Canadian Journal of Biochemistry*, vol. 42, 1964, pp. 345-352.) National Research Council, Sussex St., Ottawa 52, Canada.

Utilization of Lipids by Fish. III--Fatty Acid Oxidation by Various Tissues from Sockeye Salmon (ONCORHYNCHUS NEKKA), by R. E. E. Jones and E. Bilinski, Reprint No. 766, 4 pp., printed. (Reprinted from *Journal of the Fisheries Research Board of Canada*, vol. 21, no. 3, 1964, pp. 653-656.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Viajes de los salmones y regreso al rio natal" (Migrations of salmon and their return to their native river), by

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

R. Vibert, article, *Montes*, vol. 18, no. 107, 1962, pp. 385-395, printed. Publicacion de los Ingenieros de Montes, Luchana 17, Madrid, Spain.

#### SARDINES:

Existing Regulations of Sardine Fishing, GFCM Studies and Reviews No. 20, 27 pp., illus., printed, 1963. Legislation Research Branch, Food and Agriculture Organization of the United Nations, Viale della Terme di Caracalla, Rome, Italy.

#### SEAL:

"Diving depths of the Weddell seal," by Arthur L. DeVries and Donald E. Wohlschlag, article, *Science*, vol. 145, no. 3629, July 17, 1964, p. 292, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### SEA LAMPREY:

Paper Electrophoretic Patterns of Land-Locked Sea Lamprey (PETROMYZON MARINUS L.) Serum, by M. L. H. Thomas, Manuscript Report Series, Biological, no. 726, 41 pp., printed, 1962. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

#### SEAWEED:

"Tasmanian seaweed," article, *Food Technology*, vol. 18, April 1964, p. 119, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

#### SENSORY ORGANS:

Sound Detection in Teleost Fishes, by J. Wodinsky and W. N. Tavolga, 12 pp., printed, 1964. (Reprinted from *Marine Bio-Acoustics-Proceedings of a Symposium held at Bimini, Bahamas, April 1963*, pp. 269-280.) The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y.

#### SHAD:

Summer Food of Juvenile American Shad in Virginia Waters, by William H. Massmann, 5 pp., illus., printed. (Reprinted from *Chesapeake Science*, vol. 4, no. 4, December 1963, pp. 167-171.) Sport Fishing Institute, Bond Bldg., Washington, D. C. 20005.

#### SOUTH AFRICA:

"Ships, scientists in a broad study of S. A. fish resource," article, *The South African Shipping News and Fishing Industry Review*, vol. 19, no. 5, May 1964, pp. 97, 99, 101, 103, illus., printed, single copy 30 cents (about 42 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., P.O. Box 80, Cape Town, South Africa Republic. Discusses the research program of the Division of Sea Fisheries and its substantial changes in the last year in order to ensure the best possible use of its vessels in studying South Africa's commercial fish and their ocean environment.

#### SPINY LOBSTERS:

"Report on South African rock lobsters. Part I--Notes on the reproductive biology and size limit of S. A. rock lobsters," by A. E. F. Heydorn, article, *The South African Shipping News and Fishing Industry Review*, vol. 19, no. 5, May 1964, pp. 89, 91, 93, 95, illus., printed, single copy 30 cents (about 42 U. S. cents). Thomson Newspapers, South African (Pty.)

Ltd., P.O. Box 80, Cape Town, South Africa Republic. This article deals with the determination of the size at which the South African rock lobster *Jasus lalandii* attains sexual maturity and with the reproductive potential of this species at various stages in its growth. The biological implications of a reduction in the minimum legal size limit are discussed.

"Temperatures in cartons of live rock lobsters," by R. A. Harvey, article, *Annual Report 1962, Fishing Industry Research Institute*, p. 18, illus., printed. Fishing Industry Research Institute, Cape Town, South Africa Republic.

#### SQUID:

ENOPLUTEUTHIS ANAPYSIS, a New Species of Enoplateuthid Squid (Cephalopoda: Oegopsida) from the Atlantic Ocean, by Clyde F. E. Roper, Contribution No. 521, 9 pp., illus., printed, 1964. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 14, no. 1, March 1964, pp. 140-148.) The Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### SUBMARINES FOR OCEANOGRAPHY:

Underwater Observations During the Fifth Voyage of the Submarine SEVERYANKA, by O. A. Sokolov, OTS 52-19789, 28 pp., printed, February 19, 1962, \$2.60. (Translated from the Russian *Okeanologia*, vol. 1, no. 4, 1961, pp. 757-761.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### TAIWAN:

Fishing Sampans in Taiwan, by Han-po Lui, 82 pp., illus., printed in Chinese with English summary, 1963. Taiwan Fisheries Bureau, Department of Agriculture and Forestry, Provincial Government of Taiwan, Taipei, Taiwan.

"Tuna industry of Taiwan," by C. C. Yang, article, *Industry of Free China*, vol. 21, no. 2, February 25, 1964, pp. 2-21, printed. *Industry of Free China*, 118 Huai Ning St., Taipei, Taiwan. The first part of this article discusses the outlook of the world tuna fishery--characteristics of tuna fishing, background and current situation, international trade, features of the Japanese tuna trade, and resource and marketing problems affecting future fishery development. Part 2 gives a brief history of Taiwan tuna fishing--expansion of the fleet after 1955; part 3 covers the present situation in Taiwan and some economic problems of the fishery, Singapore and Penang-based operations, and future fishing plans off Madagascar and Malaysia; part 4 presents conclusions and recommendations. "It is generally agreed that future expansion should not be planned exclusively on the basis of export but should be supported by a high level of consumption at home in view of the world market situation," states the author.

#### TARIFFS AND TRADE:

GATT--What It Is...What It Does...How It Works, 22 pp., printed, 1964. The Information and Library Services, GATT Secretariat, Villa Le Bocage, Palais des Nations, Geneva 10, Switzerland.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

## THAILAND:

Foreign Trade Regulations of Thailand, by Dawn A. Wachtel, OBR 54-54, 8 pp., printed, June 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Thailand's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. The report also covers special customs provisions, non-tariff import controls, the country's export controls, United States foreign trade controls, and Government representation between the two countries. The import of some fishery products into Thailand is regulated by Government authorities.

## THAWING:

Electrical Resistance Thawing of Fish, by H. R. Sanders, Torry Memoir No. 143, 5 pp., printed, 1963, Torry Research Station, Aberdeen, Scotland.

## TRAINING:

Course for Apprentice Fishermen, edited and compiled by "World Fishing," 92 pp., illus., printed, 8s. 6d. (about US\$1.20). Grampian Press Ltd., The Tower, 229-243 Shepherd's Bush Rd., Hammermith, London W6, England. Contains a series of articles previously published individually in the periodical World Fishing. In addition, there is a chapter on stern trawling. Subjects covered include, among others, the trawler's basic points; how the trawl works; danger on deck; first steps in net mending; blocks and tackles; and the net store. Also covered are gutting, stowing, and icing; handling a ship; the compass; understanding charts; courses and bearings; radio navigation aids; rules of the road; and safety and survival.

## TRAWLERS:

The Refrigerated Fishing Trawler TROPIK (Rybolobno-morozil'nyi trawler "Tropik"), by N. I. Borisov, Navy Tr. 3425 ONI 939, 11 pp., printed, 1962. (Translated from the Russian, Rybnoe Khosiaistvo, vol. 38, no. 8, pp. 32-41.) Department of Navy, Office of Naval Intelligence, Washington, D. C. 20360.

## TREATIES:

The Japan-United States-Canada Fisheries Treaty and the Japan-Soviet Fisheries Treaty, by Kenzo Kawakami, 13 pp., printed. (Translated from the Japanese, Kokusai Mondai, no. 5, 1963.) Department of State, Division of Library and Reference Service, 132 State Annex 1, Washington, D. C.

## TROUT:

On the tolerance of rainbow trout, *Salmo gairdneri* irideus Gibbons, to salt water, by T. Awakura, article, Suisan Fukajo Kenkyu Hokoku, vol. 17, December 1962, pp. 41-48, printed in Japanese. Hokkaido Fish Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Some observations on the breeding of rainbow trout, *Salmo gairdneri* irideus Gibbons, in salt water," by T. Awakura and others, article, Suisan Fukajo Kenkyu Hokoku, vol. 17, December 1962, pp. 49-57, printed in Japanese. Hokkaido Fish Hatchery, Fisheries Agency, Nakanoshima, Outskirt of Sapporo, Hokkaido, Japan.

"Utilization of lipids by fish. I--Fatty acid oxidation by tissue slices from dark and white muscle of rainbow trout (*Salmo gairdneri*)," by E. Bilinski, article, Canadian Journal of Biochemistry and Physiology, vol. 41, January 1963, pp. 107-112, printed. Division of Administration and Awards, The National Research Council, Sussex St., Ottawa 2, Canada.

## TUNA:

"Body temperature of yellowfin and skipjack tunas in relation to sea surface temperature," by Izadore Barrett and Frank J. Hester, article, Nature, vol. 203, no. 4940, July 4, 1964, pp. 96-97, illus., printed, single copy 4s. (about 55 U. S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"Considerações práticas sobre o enverdecimento do atum tropical (1)" (Practical considerations on development of green meat in tropical tuna), by J. F. Aldrin, article, Conservas de Peixe, vol. 19, no. 219, June 1964, pp. 15-17, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Angos, 68, Lisbon, Portugal.

"Migration of a tagged bluefin tuna across the Pacific Ocean," by Craig J. Orange and Bernard D. Fink, article, California Fish and Game, vol. 49, no. 4, 1963, pp. 307-309, printed. Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif. 95814.

"Preliminary age determination of bluefin tuna, *Thunnus thynnus*," by Robert R. Bell, article, California Fish and Game, vol. 49, no. 4, 1963, p. 307, printed. Printing Division, Documents Section, No. Seventh St. at Richards Blvd., Sacramento, Calif. 95814.

## UNDERWATER PHOTOGRAPHY:

"Combination camera and bottom-grab," by K. O. Emery and A. S. Merrill, article, Oceanus, vol. 10, no. 4, June 1964, pp. 2-7, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass. The identification of animals shown on bottom photographs has been a problem. This difficulty has been solved by combining a bottom sampler as a source of specimens and a camera to view ecological relationships at the same site.

"A wide-angle attachment for underwater photography with 16 mm. motion-picture camera," by A. S. Lodkin, article, USSR Industrial Development: Soviet Precision Equipment, No. 50, OTS 63-13642, 38 pp., printed, December 26, 1962, \$3.60. (Translated from the Russian, Tekhnika Kino i Televideniya, vol. 6, no. 9, 1962, pp. 3-19.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

## UNITED KINGDOM:

Government Publications--Department of Agriculture and Fisheries for Scotland, Sectional List No. 52, 23 pp., printed, revised to March 31, 1963. Her Majesty's Stationery Office, London, England. (For sale by British Information Services, 845 Third Ave., New York, N. Y. 10022.)

Government Publications--Fisheries, Sectional List No. 23, 11 pp., printed, revised to March 13, 1962. Her Majesty's Stationery Office, London, England. (For sale by British Information Services, 845 Third Ave., New York, N. Y. 10022.)

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Journal of the Marine Biological Association of the United Kingdom, vol. 44, no. 2, June 1964, 278 pp., illus., printed, \$13.50. Cambridge University Press, 32 E. 57th St., New York 22, N.Y. Includes, among others, the following articles: "Line-fishing of the continental slope," by G. R. Forrester; "Observations on the fertility of the oyster (*Ostrea edulis*)" by P. R. Walne; "The feeding of plaice and sand-eel larvae in the southern North Sea," by J. S. Ryland; and "A revised check-list of British marine algae," by Mary Parke and P. S. Dixon.

Sea Fisheries Statistical Tables, 1963, 46 pp., printed, 1964, 5s. (about 70 U.S. cents). Ministry of Agriculture, Fisheries and Food, London, England. (Available from Sales Section, British Information Services, 845 Third Ave., New York, N.Y. 10022.) Includes statistics on fish of British taking, imports and exports, and demersal and pelagic landings.

#### U.S.S.R.:

The Effect of the Fishing Industry on the Biological Characteristics of Fish (from Archeological Records), by V. D. Lebedev, Translations No. 114, 10 pp., printed, 1963. (Translated from the Russian, Trudy Soveshchan.) Fisheries Laboratory, Department of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

Fishes of the Northern Seas of the U.S.S.R. (Ryby severnykh morei SSSR), by A. P. Andriyashev, OTS 63-11160, 621 pp., illus., processed, 1964, \$6.25. (Translated from the Russian, Keys to the Fauna of the U.S.S.R., No. 53, Zoological Institute of the U.S.S.R. Academy of Sciences, Moscow, U.S.S.R., 1954.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

Fishing Economy, 1960, OTS 63-21559, 28 pp., printed, April 10, 1963, 75 cents. (Translated from Russian.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20230.

Rybnoe Khoziaistvo, vol. 40, no. 6, June 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U.S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, these articles: "From the speech of the Chairman of the Federal Fisheries Committees at the Conference of Young Far East Fishermen;" "The formation of cod stocks in the waters off western Greenland," by M. A. Pavlov; "The effect of transport conditions on the survival rate of mussels," by A. I. Ivanov; "Our experience with large-scale sturgeon farms in Azerbaizhan," by M. Ramazanov; "The fish caught by our vessel is the cheapest of all fish caught by the Murmansk trawler fleet," by L. N. Gruzdev; "The rules of signaling and movement for fishing vessels when engaged in joint operations (with vessels of other countries)," by N. S. Goriunov; "How to decrease the time needed to repair vessels and increase the quality of work," by L. G. Glazkov and others; "Improved trawl used in herring fishery by medium fishing trawlers (SRT) with 300 and 400 hp.," by A. V. Chentsov; "Develop and perfect the midwater pair trawling (Georges Bank)," by S. E. Shevtsov; "Herring fishing with purse seines from refrigerated medium trawlers (SRT-400)," by A. I. Kostin; "Fishing without nets for Black Sea anchovy,"

by E. G. Sharapov; "New successes of Sakhalin fishery kolkhozes," by A. A. Taranov; "Dietetic canned fish with vegetables," by G. S. Korobkina and M. D. Bogoslovskaja; "Rational exploitation of natural sources of vitamin A," by G. A. Dolbish; "Economic efficiency of Baltic herring processing," by L. Bulk-in; "Party and economic meeting of Black Sea and the Sea of Azov fishery workers;" and "Device for fishing (which regulates various depths of driftnets)," by V. P. Ivashov and others.

-M. A. Kravanja

Rybnoe Khoziaistvo, vol. 40, no. 7, July 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U.S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, these articles: "Present status and future prospects for the construction of fishing vessels," by G. B. Terent'ev; "The fishing industry of the Far East in the new stage of development," by S. H. Naddaidze; "We must better exploit the resources of the Northern fishing basin," by A. I. Filippov; "Butterfish (*Poronotus*)," by A. A. Dubovitskii; "Biological basis of the ichthyofauna reconstruction of the Riga Gulf," by V. S. Tanasichuk; "Smooth-spined grenadier (*Macrourus berglax*); its chemical composition and utilization," by E. F. Klele; "Manufacturing of sausages from frozen yellowfin tuna," by Z. A. Iakovleva and G. S. Khristofersen; "The effect of angle parameters of the knife on the cutting force during slicing of (tuna) fish," by M. A. Iakovlev; "Utilization of Bering Sea shrimp," by V. S. Gordievskii; "Distribution of pelagic larvae of the Kamchatka crab in the waters of western Kamchatka," by R. R. Markarov; "Our experiences with the tagging of the Pacific navaga (*Eleginus gracilis*) in the Taiskaia Inlet," by B. A. Gritsenko; "Commercial testing of automated trawl boards," by V. Novofastovskii; "Electrofishing for Azov (Sea) anchovy," by I. I. Luzanov; "Economic efficiency of the utilization of production refrigerators in the trawling operation in the Barents Sea," by V. I. Zakurdaev; "Problems in calculating costs in the fishing industry," by L. M. Guzhava; and "Evaporating plant on the whaling factory-ships Vladivostok and Dalni Vostok," by B. M. Rogalev.

-M. A. Kravanja

#### WEATHER CHARTS:

The following processed weather charts are published by the Weather Bureau, U.S. Department of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings; explanations of warning displays; and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

Canadian Border to Eureka, Calif., and Alaska, 1964.  
Eureka to Point Conception, Calif., 1964.  
Hawaiian Islands, 1964.  
Morgan City, La., to Apalachicola, Fla., 1964.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### WHALE MEAT:

"Nutritive value of whale meat," by Takashi Kaneda, Hisae Sakai and Seinosuke Ishii, article, Chemical Abstracts, vol. 59, November 11, 1963, 11965g, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

#### WHALES:

"La caza de cachalotes en el Peru: estadísticas de captura para los años 1947-1961 y un intento de analizar las condiciones de la población en el periodo 1954-1961" (The catch of sperm whales in Peru: statistics of capture for the years 1947-1961 and an analysis of the conditions of the population in the period 1954-1961), by G. Saetersdal, J. Mejia, and P. Ramirez, article, Boletín, vol. 1, no. 3, 1963, pp. 45-84, printed in Spanish. Instituto de Investigación de los Recursos Marinos, La Punta, Callao, Peru.

Periodicity of Humpback Whale Feeding in the South Atlantic Ocean, by M. V. Ivashin, OTS 63-21443, 8 pp., printed, March 28, 1963, 50 cents. (Translated from the Russian, Biulleten' Moskovskoe Obshchestvo Ispytatelei Prirody, Otdel Biologicheskii, vol. 36 [66], no. 6, 1961, pp. 110-115.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

The Scientific Reports of the Whales Research Institute, no. 18, 189 pp., illus., printed, March 1964. The Whales Research Institute, 12-4 Tsukishima Nishigashidori, Chuo-ku, Tokyo, Japan. Includes, among others, the following article: "Fin whale sub-populations in the Antarctic whaling areas II, III, and IV," by K. Fujino; "Examination on age determination of the fin whale," by S. Ohsumi; and "Squids as the food of sperm whales in the Bering Sea and Alaskan Gulf," by T. Okutani and T. Nemoto.

The 20-Cycle Signals and Balaenoptera (Fin Whales), by W. E. Schevill, W. A. Watkins, and R. H. Backus, Contribution No. 1393, 6 pp., printed, 1963. (Reprinted from Marine Bio-Acoustics - Proceedings of a Symposium held at Bimini, Bahamas, April 1963, pp. 147-152.) Woods Hole Oceanographic Institution, Woods Hole, Mass.

#### WHALING:

"One hundred years of Norwegian whaling--The start and the first year," by Asbjorn Bakken, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 5, May 1964, pp. 122, 124-128, 130-132, 134-137, illus., printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway.

"Whales and whaling," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 4, April 1964, pp. 85-88, printed, Hvalfanger-

foreningen, Sandefjord, Norway. An excerpt from the Annual Report of the National Oceanographic Council for the period April 1, 1962-March 31, 1963. "Broadly the findings are that blue and humpback whales have been reduced to so small a remnant of the original stocks that only total protection for an indefinite period will allow them to recover, and that although there is a much larger surviving stock of fin whales, that too is declining and a drastic reduction of catching, to about a quarter of the present level, is needed for the stock to begin its recovery," states the article.

"Whales and whaling in the Western Pacific," by R. J. A. W. Lever, article, South Pacific Bulletin, vol. 14, no. 2, April 1964, pp. 33-36, illus., printed, single copy 30 cents. South Pacific Commission Publications Bureau, G. P. O. 5254, Sydney, Australia. Gives an account of whaling activities in Melanesia and Polynesia from 1789 to 1860. Discusses the early history of whaling in the area, types of whales hunted, main whaling grounds and island bases, the spouting of whales, use of whale teeth (ivory) for making jewelry, and decline of the industry in the Pacific.

"Whaling in the Antarctic in season 1962/63," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 52, no. 9, September 1963, pp. 249-252, 255-256, 259-262, 265-274, illus., printed, Hvalfangerforeningen, Sandefjord, Norway.

#### WHITEFISH:

"Age and growth of the round white fish in Lake Michigan," by Donald Mraz, article, Transactions of the American Fisheries Society, vol. 93, no. 1, 1963, pp. 46-52, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

"On the competition between whitefish species," by Thorolf Lindstrom and Nils-Arvid Nilsson, article, The Exploitation of Natural Animal Populations, A Symposium, 1960, pp. 326-340, printed, 1962, John Wiley and Sons, Inc., 605 3rd Ave., New York, N. Y.

White Fish Authority, Annual Report and Accounts for the Year Ended 31st March 1964, 54 pp., illus., printed, June 1964, 4s. (about 55 U. S. cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England. Covers production, distribution and marketing, research and development, and administration of white fish fisheries.

#### WORLD PRODUCTION:

"Marine fish production: A world-wide view," by C. P. Idyll, article, Proceedings of the International Congress of Zoology, vol. 16, no. 4, 1963, pp. 330-335, printed. Secretary, Permanent Committee of International Zoological Congresses, 105 Blvd. Raspail, Paris 6, France.



## FISH 'N SEAFOOD PARADE



The new emblem for "Fish 'n Seafood" promotions. Reproduction proofs for use in promotion pieces, food store newspaper ads, etc., are available from the National Fisheries Institute.

A month-long campaign to promote the sale of fishery products got under way October 1, 1964. Theme of the promotion: "Fish 'n Seafood Parade." Its sponsor: the National Fisheries Institute, 1614 20th Street NW., Washington, D. C.

Many food stores and chain stores, dealers, retailers, etc., tied in their advertising into the "Fish 'n Seafood Parade" promotion.

The Shrimp Association of the Americas also featured October as the time for "Shrimp Fiesta."

**OCTOBER**

## SHRIMP FIESTA

**can put shrimp glamour into your menu...extra profits into your till**

Here are five tempting ways to take advantage of the high customer-preference for shrimp. And, in addition, you get natural portion control with low preparation cost and high mark-up.

Radio, TV and newspapers will be telling your customers that October is Shrimp Fiesta Month. It's easy to tie in with this extra-profit promotion. Serve shrimp throughout October...and all year long.







Start extra profits marching your way with the  
**FISH 'N SEAFOOD PARADE**  
throughout October

**SHRIMP**  
*America's Popular Seafood*  
*Serve It Everyday*

SHRIMP ASSOCIATION OF THE AMERICAS

Advertisement used by Shrimp Association of the Americas to promote shrimp during "Fish 'n Seafood" month in October 1964.

### USE OF MANATEES TO CONTROL AQUATIC WEEDS

A three-year study of manatees or sea cows and their usefulness in controlling aquatic weeds has been launched by the Central and Southern Florida Flood Control District (FCD), according to a June 23, 1964, press release issued by that agency.

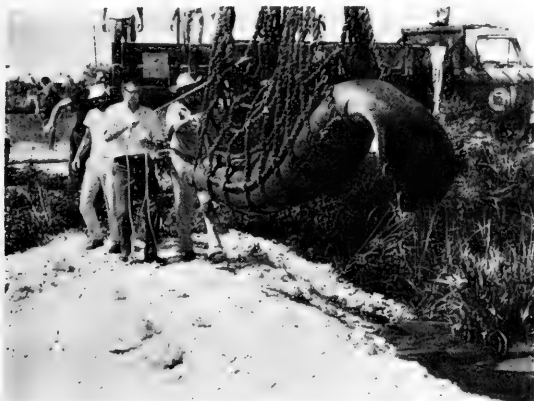


Fig. 1 - At the test site, manatee is lowered carefully into canal which has been blocked with an earthen dam, foreground. A quarter-mile section has been fenced off for the initial tests to see how fast the mammals will eat the vegetation in this waterway. Later they'll be put to work in other sections of canals.

have been gleaned all the information available. Oddly, scientists know very little about manatees, except that they are strict vegetarians, and they apparently consume vast quantities of weeds. Most authorities consulted by the FCD strongly urged sponsorship of the pilot study which is now under way.

The Executive Director of the 18-county FCD notes that present chemical and mechanical methods of weed control are costly. The FCD is spending \$140,000 a year to keep its canals clear of obnoxious vegetation. But the FCD system, which now includes more than 1,300 miles of canals, is only 40 percent completed. The Director predicts that ultimately the FCD will have to spend \$500,000 a year on weed control--unless some new method is discovered to cut costs or do a better job.

The water hyacinth (with its lovely purple blooms) is only one of a number of weeds which, if left uncontrolled, would soon multiply, spread, and choke the arteries that carry flood waters in rainy seasons, irrigation and municipal supplies in dry times.

FCD boat crews operating throughout the 15,000 square miles of the District are now using chemical sprays to control the hyacinth and the large-leaved water lettuce. But those two types of "floating" aquatics don't really pose as serious problems as do the submerged weeds. Four principal types of underwater weeds--elodea, coontail, southern naiad, and alligator weed--are infinitely more troublesome, because there is no practical or economical way to control them with chemicals.

The District uses a mechanical plow (actually a large steel A-frame) to uproot the underwater weeds. The "plow" is dragged along canal bottoms by an amphibious "duck," a surplus military vehicle. Draglines are used to remove the uprooted weeds from canals. But the FCD has to do the job over and over again, about once every 4 months.

(continued on next page)

Five of the cumbersome mammals (which can grow to more than 12 feet in length and weigh more than a ton) were netted in the Miami River and placed (on May 7) in a sturdily fenced sector of a canal where weed growth is typical.

Scientists from Florida Atlantic University at Boca Raton are directing the study, under contract from the Flood Control District. The FCD will pay \$34,000 to the University to find out just how many weeds manatees can eat, to study their rate of reproduction, and to learn whether or not the mammals can be used practically and economically as a means of biological weed control.

For more than two years FCD officials have been investigating the possible use of the mammals. They

Since some authorities are concerned about the long-range possible side-effects of continued use of chemical herbicides, a means of biological weed control might well be preferred, if practical.

Loaded into wooden boxes, filled with water, the manatees were transferred by trucks from the Seaquarium to the selected FCD canal. They are now busily at work eating weeds. And watching them from the canal banks is an assistant professor of Florida Atlantic University, who is directing the study program. Also watching from the banks are officers of the Florida Board of Conservation. The manatee is protected under Florida law, and a stiff fine and jail term await anyone who molests or kills one.

A July 16 letter from the FCD points out: "It became obvious earlier this month that they are doing an excellent job of clearing the canal and we expect to move them or release them to another reach of the canal. . . ."

It's hoped that the new study will help in preservation of the manatee--now threatened with possible extinction--as well as providing a new answer to weed control problems in Florida. (News Release, June 23, 1964, Central and Southern Florida Flood Control District, West Palm Beach, Fla.)

Note: See Commercial Fisheries Review, April 1960 p. 5.



Fig. 2 - Close-up of a manatee or sea cow in a cargo net, being transferred from a tank at the Miami seaquarium to a truck for transfer to the test sector of the canal.



#### SHARKS CAN DETECT PREY BY VIBRATION

"Sharks can sense their prey by vibration at a distance of a quarter of a mile. After this they rely on their sense of smell, and at 50 feet, they begin to use their eyes. At 10 feet, vision is their primary sense." This statement was made by a Professor of Zoology at Cornell University, at the ANZAAS Conference in Canberra, Australia, on the technique of operating on living sharks and current investigations of their heart and sense organs. Considerable work on sharks is done at the Lerner Marine Laboratory of the American Museum of Natural History at Bimini, in the Bahamas. Sharks measuring up to 17 feet long are maintained there for experimental and behavioral study in three pens constructed of stainless steel chain-link fencing. (Fisheries News-letter, Canberra, Australia, April 1964.)



## BLUENOSE--CANADA'S MOST FAMOUS SAILING VESSEL

Bluenose, Canada's most famous sailing vessel, was built in 1921 to challenge for the International Fishermen's Trophy--won the previous year by the United States schooner Esperanto. Bluenose regained the Cup for Canada in the first Series she sailed. She never once relinquished it throughout a keenly contested career, spanning two decades. She final-

### SAIL PLAN



1. Jib topsail
2. Jib
3. Jumbo
4. Foresail
5. Fore gaff-topsail
6. Fisherman's staysail
7. Mainsail
8. Main gaff-topsail

### DIMENSIONS

Overall Length	143'
Beam	27'
Waterline	112'
Depth Main Hatch	11'6"
Draught	15'10"
Mainmast, above Deck	81'
Foremast, above Deck	73'
Main-topmast, overall	53'6"
Fore-topmast, overall	48'6"
Sail area, including Fisherman's Staysail, approximately	10,900 sq. ft.
Mainboom	81'
Maingaff	51'
Foreboom	32'6"
Foregaff	32'6"
Displacement	285 tons



The schooner Bluenose II under full sail.

ly had to be sold, and ended her days as a freighter among the islands of the West Indies. She struck a Haitian reef and sank in 1946. Bluenose II was launched on July 24, 1963, from the same shipyard at Lunenburg that had constructed her predecessor. Bluenose II was created with two purposes in mind: (1) as the most fitting of memorials to a great ship; (2) as a goodwill ambassador and symbol of Nova Scotian hospitality. She is in all details of sail-plan and hull identical to the original Bluenose.



### IMPORTANT NOTICE

Due to an unexpected mix-up in the mailing of the June 1964 issue of the magazine, there are probably a number of subscribers who did not receive that issue. If you are one of those who did not receive that issue, write us for a copy.

